

Updated - November 2014

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**Submitted to:**

Bureau of Land Management  
Carson City District –  
Sierra Front Field Office  
5665 Morgan Mill Road  
Carson City, Nevada 89701  
(775) 885-6000



And -

Nevada Division of  
Environmental Protection  
Bureau of Mining Regulation  
& Reclamation  
901 S. Stewart St, Ste 4001  
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# Draft Plan of Operations

## Nevada Reclamation Permit Application

### Bonaventure Nevada, Inc. Hercules Exploration Project Lyon County, Nevada



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## **Nevada Reclamation Permit Application**

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**Hercules Exploration Project**  
**Lyon County, Nevada**

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## List of Acronyms

<b>Acronym</b>	<b>Definition</b>
BLM	Bureau of Land Management, Carson City District, Sierra Front Field Office
BMP	Best Management Practice
BMRR	Bureau of Mining Regulation and Reclamation
BVT	Bonaventure Nevada, Inc
CFR	Code of Federal Regulations
GPS	Global Positioning System
MDB&M	Mount Diablo Base and Meridian
MSDS	Material Safety Data Sheets
NAC	Nevada Administrative Code
NDEP	Nevada Division of Environmental Protection
NRS	Nevada Revised Statute
NvMA	Nevada Mining Association
PLS	Pure Live Seed
RCE	Reclamation Cost Estimate
RCE	Nevada Standard Reclamation Cost Estimator
USGS	U. S. Geological Survey

## INTRODUCTION

This Plan of Operations and Nevada Reclamation Permit Application (Plan) is submitted to the Bureau of Land Management, Carson City District, Sierra Front Field Office (BLM), and the Nevada Division of Environmental Protection (NDEP) Bureau of Mining Regulation and Reclamation (BMRR) by Bonaventure Nevada, Inc. (BVT) for the Hercules Exploration Project (Project) located in Lyon County, Nevada.

This Plan is submitted in accordance with BLM Surface Management Regulations, in 43 Code of Federal Regulations (CFR) 3809, as amended, and Nevada reclamation regulations at Nevada Administrative Code (NAC) 519A. The format for this Plan is consistent with the BLM and BMRR suggested application form, which has been determined acceptable to the BLM for their mining plans of operation in accordance with the Memorandum of Understanding between the BLM and NDEP.

The Project is located entirely on public lands administered by the BLM in all or parts of Sections 13, 14, 23, 24, 25 and 26, Township 16 North, Range 22 East, and portions of Sections 7, 18, 19 and 30, Township 16 North, Range 23 East, Mount Diablo Base and Meridian (MDB&M) in Lyon County, Nevada (Project Area). The Project Area can be accessed by traveling approximately nine miles east on Highway 50 (US-50) from Carson City to the Dayton Valley Road intersection at Dayton, Nevada. A paved road is traveled for approximately five miles east; then a dirt road is traveled for approximately five miles southeast to the historic Hercules Mine. Figure 1 shows the general location of the Project Area and Project access (Appendix A).

BVT proposes to expand existing Notice-level (N-89713) exploration activities within the 2,320-acre Project Area. Proposed activities consist of exploration drilling from 167 constructed drill sites and trenching at 25 sites all accessed by existing and proposed constructed roads. Maintenance of the main access road from Dayton Valley Road to the project site will occur, including construction of waterbars, removal of boulders in the travel way, and grading of rough segments. All maintenance of existing access roads will be completed within the existing road footprint including existing travel way and side berms. As such, this activity has not been documented as “new disturbance”, but will occur along approximately 3.18 miles of existing access road. BVT proposes to conduct exploration related activities that will create approximately 6.3 acres of new surface disturbance. In addition, there are approximately 4.60 acres of existing disturbance, completed under NOI-level activities, and an anticipation that the 0.40 acres remaining for NOI-level activities left will be utilized in the near future. The total Project-related disturbance, including all NOI-level work and work completed under this POO, is estimated to be 22.62 acres. Disturbance details are presented in Table 1. Existing and proposed surface disturbance are shown on Figure 2 (Appendix A).

**Table 1: Acreage of Existing and Proposed Project Surface Disturbance**

<b>Exploration Activity</b>	<b>NOI-Level Existing Surface Disturbance (acres)</b>	<b>Proposed Surface Disturbance (acres)</b>	<b>Total Surface Disturbance (acres)</b>
<b>Constructed Roads</b>	1.53	11.30	12.83
<b>Constructed Drill Sites (including sumps)</b>	2.93	5.52	8.45
<b>Constructed Trenches</b>	0.00	0.31	0.31
<b>Cross Country</b>	0.14	0.48	0.62
<b>NOI Work to be Completed</b>	0.00	0.40	0.40
<b>Total Disturbance</b>	<b>4.60</b>	<b>18.02</b>	<b>22.62</b>

BVT has projected that the total existing and proposed surface disturbance will be approximately 22.62 acres. Construction activities will occur over three years, with all Project activities bonded for at one time. The Standard Reclamation Cost Estimator (SRCE) in Appendix C includes the existing and proposed surface disturbance, which totals 17.77 acres. The total surface disturbance that will be bonded for under the Plan is 22.62 acres.

BVT will provide the BLM and NDEP an annual report on or before April 15 of each year that documents surface disturbance locations, types of surface disturbance, and any completed concurrent reclamation. An updated SRCE will be supplied every three years, with sufficient lead time to be approved on or before the anniversary of the Plan approval

## 1.0 OPERATOR/CLAIM INFORMATION

### 1.1 Operator Information

<b>Operator Name:</b>	Bonaventure Nevada, Inc.
<b>Mailing Address:</b>	4235 Christy Way Reno, Nevada 89519
<b>Phone Number:</b>	(775) 746-4471
<b>Tax Payer Identification Number:</b>	47-0935982
<b>Resident Agent:</b>	Richard Kern 4235 Christy Way Reno, Nevada 89519

### 1.2 Authorized Field Representative

BVT personnel, or their agents, will be on site during all Project related activities and will be responsible for implementing and ensuring that all activities are completed in accordance with this Plan.

<b>Emergency Contact Information:</b>	Richard Kern 4235 Christy Way Reno, Nevada 89519 Phone: (775) 746-4471 Fax: (775) 746-0938
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### 1.3 Corporate Information

Same as Sections 1.1 and 1.2

**1.4 Claimant/Claim Information (if different than operator information)**

<b>Claimant(s) Name:</b>	MinQuest, Inc.
<b>Mailing Address:</b>	4235 Christy Way Reno, Nevada 89519
<b>Phone Number(s):</b>	(775) 746-4471
<b>Primary Commodity:</b> (e.g., gold, silver, copper, turquoise, barite, etc.)	Gold
<b>Claim Name(s):</b>	See Appendix B
<b>BLM Serial Number of Mining Claim(s) where disturbance will occur:</b>	See Appendix B
<b>Claim Type(s):</b> (Lode, Mill Site, Placer, etc.)	Lode

## **2.0 DESCRIPTION OF PROJECT**

### **2.1 Legal Description**

The Project Area is located in all or parts of Sections 13, 14, 23, 24, 25 and 26, T16N, R22E, and Sections 7, 18, 19 and 30, T16N, R23E, MDB&M.

### **2.2 Surface Ownership of the Land within the Area of Operation**

The Project Area is located entirely on public lands administered by the BLM. Figure 1 depicts land status in and around the Project Area (Appendix A).

#### *2.2.1 Private Lands*

None.

#### *2.2.2 Public Lands – BLM Administered*

The entire Project Area is located on public lands administered by the BLM.

#### *2.2.3 National Forest System Lands – USFS Administered*

None.

#### *2.2.4 State Lands*

None.

### **2.3 Description of Operations**

BVT proposes to conduct mineral exploration activities consisting of maintenance on existing roads, exploration drill road construction, drill site and sump construction, exploration drilling, trenching, and reclamation. BVT will conduct all activities within the Project Area consistent with the applicable performance standards outlined in 43 CFR 3809.420. Customary and reasonable technology and practices will be utilized so as to avoid unnecessary environmental impacts and also facilitate reclamation. Project activities will consist of exploration drilling from a total of 167 sites (5.52 acres) and trenching at 25 sites (2,284 linear feet or 0.31 acre) that will be accessed by approximately 24,535 linear feet (11.30 acres) of proposed constructed exploration drill roads with 12-foot running widths, 5,191 feet of cross country access with an estimated disturbance width of 4-feet (0.48 acres), existing Notice-level constructed roads, and pre-January 1981 existing roads. The locations of these activities are depicted on Figure 2 (Appendix A). The following sections describe general operating procedures, construction techniques, and equipment that BVT anticipates using.

#### *2.3.1 Topographic Maps*

The topographic map for the Project Area is the Como, Nevada 7.5' U. S. Geological Survey (USGS) quadrangle. Figures 1 and 2 utilize the USGS topographic map as a base layer (Appendix A).

#### *2.3.2 Equipment*

Project personnel will access the Project Area in four-wheel drive vehicles. Over the life of the Project, drilling will be conducted by up to two drill rigs (track or rubber tired reverse circulation drill rig and

core drill rig). The following support vehicles and equipment could be used in conjunction with the drilling rigs over the life of the Project:

- Four 4x4 pickup trucks;
- Two 1,000-gallon water trucks;
- One 5,000-gallon water truck;
- Up to two mud mixing tanks and pumps;
- One circulation tank;
- Two pipe trucks;
- One casing truck;
- One backhoe;
- One auxiliary air compressor;
- One portable light plant/generator;
- One Caterpillar D6-8 bulldozer;
- One grader or equivalent; and
- One medium-sized excavator.

### 2.3.3 *Work Force*

Standard drill rig crews usually consist of one drill operator and one to two helpers. The helpers remove and box the recovered core or rotary samples and cuttings from reverse circulation and core rigs, mix drilling fluids in the portable mud tank, operate the water truck, assist with drilling operations, and conduct maintenance as necessary. The crew will be transported to and from the drill site in four-wheel drive vehicles. Over the life of the Project, up to two drill rigs (reverse circulation and core) are expected to be in operation at the Project Area at any given time. Up to a total of ten individuals will be working at the Project Area at a given time, including two geologists and up to eight drill operators and helpers. Drilling activities will generally be limited to daylight hours but could continue up to 24 hours per day for some drill rigs.

### 2.3.4 *Road Construction*

The Project Area will be accessed via existing pre-1981 roads, cross country access, existing roads constructed under Notice-level activities, and proposed constructed roads (Figure 2). When new road construction is necessary, roads will be built with a 12-foot running surface including safety berm as necessary. Approximately 24,535 linear feet (11.30 acres) of roads will be constructed for the Project.

Exploration roads that require earth-moving will be contoured using typical construction practices for temporary mineral exploration roads to minimize surface disturbance, erosion, and visual contrast, as well as to facilitate reclamation. Road construction will be implemented using a Caterpillar motor grader, backhoe, or equivalent equipment. Road grades will be no steeper than ten percent, except for short drill spurs, in order to be consistent with the BLM roads manual.

A road cut and fill diagram has been included in Appendix C. The proposed disturbance acreage associated with the exploration roads has been calculated and is shown in Table 2 The acreages in

Table 2 are approximate (but conservative) values and may change depending on exploration results.

**Table 2: Constructed Road Lengths, Cross Slope Angle, and Average Disturbance Width**

Road Category % Cross Slope	Estimated Cross Slope (%)	Length (feet)	Running Width (feet)	Disturbance Width (feet) – Adjusted for Cross Slope	Total Road Disturbance (acres)
Road 1: 0 – 10	5	804	12	12.5	0.23
Road 2: 11 – 20	15	2,526	12	14.0	0.81
Road 3: 21 – 30	25	6,049	12	16.5	2.29
Road 4: 31 – 40	35	1,988	12	19.0	0.87
Road 5: 41 - 50	45	13,167	12	23.5	7.10

Balanced cut and fill construction will be used to the extent practicable to minimize the exposed cut slopes and the volume of fill material. Since the depth of cut will be kept to a minimum, growth media removed during construction will be stockpiled as the fill slope to be used during reclamation. Trees removed during the construction of drill roads will be stockpiled and used during reclamation of the roads for slope stabilization and to act as water bars. Road construction within drainages will be avoided whenever possible. When drainages must be crossed with a road, Best Management Practices (BMPs) established by NDEP and the Nevada Division of Conservation Districts through the State Environmental Commission ([1994](#)) will be followed to minimize the surface disturbance and erosion potential. Culverts will generally not be installed on exploration roads. However, if a culvert is necessary, the placement and size will be approved by the BLM and BMRR.

Maintenance of existing roads will include minor seasonal regrading and reestablishment of water bars as necessary, as outlined in BLM Manual 9113. Erosion control will be monitored in the spring and fall, or after any significant precipitation event. Maintenance of existing roads will not increase the surface disturbance within the Project Area and will consist of smoothing rutted surfaces and holes on existing access and drill roads. Maintenance of existing pre-1981 roads will be conducted only on an as-needed basis and will include minor seasonal regrading and maintenance of drainage features as necessary. If road gravel is necessary to improve some of the roads in the area, the gravel will be obtained from a BLM approved source. The gravel will be placed on the road by a dump truck and smoothed by a road grader.

### 2.3.5 Drilling and Trenching

New drill site and trench disturbance will be kept to the minimum size necessary to ensure safe access and a safe working area for the crew and equipment. Sumps will be constructed as necessary within the drill site disturbance to collect drill cuttings and manage drilling fluids.

Drill site construction within perennial and intermittent drainages will be avoided. Exceptions could

be made during dry summer months when no water is present. If that occurs, the disturbance will be reclaimed prior to the occurrence of seasonal flows in those drainages. During the life of the Project, BVT will conduct exploration drilling from 167 drill sites utilizing two drill rigs (truck-mounted reverse circulation rigs and/or one core rig or equivalent). The proposed drill sites, including sumps, are anticipated to have a surface disturbance of 5.52 acres, including sump disturbance. Sump disturbance will be constructed within the drill site disturbance and will be 12 feet by 6 feet by 2 feet deep. Drill sites will each measure approximately 60 feet long by 24 feet wide, or an average of 1,440 square feet (approximately 0.03 acre each). Surface disturbance associated with drill pad construction will vary based on the slope of the terrain where the sites are constructed. The disturbance width of the drill sites will vary from approximately 20 feet including the road running surface where located in parallel to 24 feet where the pad also serves as a turn-around. The disturbance length will vary from approximately 46 feet in flat terrain to 60 feet in steeper terrain. Disturbance calculations were based on the largest anticipated pad width of 24 feet by 60 feet.

No trenching is planned within perennial and intermittent drainages. A total of 25 trenches will be constructed that will create a surface disturbance of 0.31 acres. Trenches will average 95 feet in length, total 2,284 linear feet and average 6 feet in width including both the trench and side-case material.

All drill sites and trenches will be constructed from existing Notice-level constructed roads and proposed constructed roads. All drill sites and trenches will be completely reclaimed. Trees removed during drill site construction will be placed in stockpiles and used for slope stabilization during reclamation activities.

Drill holes will average approximately 300 feet in depth, with the shallowest hole being 100 feet in depth and the deepest hole being 1,000 feet in depth. Trenches will average 5-feet in depth. Up to 35 pre-collar holes will be drilled with a reverse circulation rig then completed with a core rig. Cuttings not bagged and removed during sample collection will be used as a source of backfill. All drill holes, except the 35 pre-collar holes, will be plugged prior to the drill rig moving from the drill site in accordance with Nevada Revised Statute (NRS) 534, NAC 534.4369, and NAC 534.4371.

Only water or nontoxic drilling fluids will be utilized, as necessary, during drilling. Under a verbal agreement, BVT will obtain water at local commercial enterprises located approximately ten miles from the Project site. BVT will access the water source and transport water to the Project site with one 5,000-gallon and two 1,000-gallon water trucks.

Standard drilling procedures usually require a geologist to be on site throughout Project-related drilling activities. The duties of the geologist generally include sitting the drill rig, logging each hole according to the geologic features encountered, determining the maximum depth of each hole, and advising the drill operator as needed. The geologist usually travels to and from the drill site in a separate four-wheel drive vehicle.

### *2.3.6 Water Management Plan*

Water will be used for dust suppression and during drilling to cool the drill bit and remove drill cuttings. Water with or without nontoxic drilling fluid additives may be utilized. Drill fluids will be

managed with the use of sumps at each drill site. Proposed construction and drilling activities will avoid springs and seeps, if present. In order to facilitate proper drainage and prevent erosion, all bladed roads will have waterbars constructed, as needed, at BLM-recommended spacing.

The management of drill cuttings will be conducted in a manner that is consistent with BMPs and includes the use of one or all of the following: sediment traps or sumps located at drill sites; straw bales (certified weed-free); silt fences; and the distribution of clarified water from sediment traps through solid pipes in order to minimize erosion caused by channeling. If needed, a sand separation system will be used in conjunction with the sediment sumps so that the recirculation of drilling fluids can be maximized.

None of the drilling fluids to be used in the Project Area contain hazardous substances. Material Safety Data Sheets (MSDS) for common drill additives are included in Appendix D.

### *2.3.7 Surface Occupancy*

Under 43 CFR 3710 Subpart 3715.0-5, occupancy is defined as full or part-time residences on the public lands. It also encompasses activities that involve residence; the construction, presence, or maintenance of temporary or permanent structures that may be used for such purposes; or the use of a watchman or caretaker for the purpose of monitoring activities. Residence or structures include, but are not limited to, barriers to access, fences, tents, motor homes, trailers, cabins, houses, buildings, and storage of equipment or supplies. No structures will be built as part of the Project. The Project will not require a laydown yard area or office trailer area.

### *2.3.8 Rock Characterization and Handling Plan*

Not applicable as this is an exploration project. However, based on Notice-level drilling, past mining, and geology of the deposit, the presence of sulfide minerals is limited. Drill cuttings will be captured in sumps and then covered as part of reclamation.

### *2.3.9 Quality Assurance Plan*

Not applicable as this is an exploration project. However, quality assurance for reclamation will be addressed under the Reclamation Plan (Section 3).

### *2.3.10 Spill Contingency Plan*

A Spill Contingency Plan is included in Appendix D.

### *2.3.11 Other Plans*

Solid wastes will be managed through collection and disposal at a state, federal, or local designated site at the end of a drill shift. A portable toilet will also be used on the Project Area and will be supplied and maintained by a Nevada-based contractor.

The following precautionary measures will be taken to prevent wildland fires: 1) all vehicles will carry a minimum of a shovel and ten gallons of water (preferably in a pump), in addition to a conventional fire extinguisher; 2) adequate firefighting equipment (shovel, Pulaski, standard fire extinguisher(s), and an ample water supply) will be kept readily available at each occupied drill site; 3) vehicle catalytic converters will be inspected often and cleaned of all flammable debris; 4) all cutting/welding torch

use, electric arc-welding, and grinding operations will be conducted in an area generally free of vegetation. An ample water supply and shovel will be on hand to extinguish any fires created from sparks. At least one person, in addition to the cutter/welder/grinder, will be at the work site to promptly detect fires created by sparks; 5) any restrictions or closures issued by the BLM that apply to the Project Area will be observed by Project personnel; and 6) any observed wildland fire will be reported immediately to the BLM Sierra Front Interagency Dispatch Center (Minden) at (775) 882-9187.

All equipment will be properly muffled and equipped with suitable and necessary fire suppression equipment, such as fire extinguishers and hand tools. All Project-related traffic will observe prudent speed limits to enhance public safety, protect wildlife and livestock, and minimize dust emissions. All activities will be conducted in conformance with applicable federal and state health and safety requirements.

All Project-related refuse will be disposed of on a daily basis consistent with applicable regulations. No refuse will be disposed of on site. In the event that hazardous or regulated materials such as diesel fuel are spilled, measures will be taken to control the spill and NDEP will be notified. A Spill Contingency Plan has been prepared (Appendix D) which outlines procedures in case of a spill. All drill holes will be abandoned in accordance with applicable federal and state standards as set forth in this Plan and discussed in detail in the Reclamation Plan (Section 3).

#### *2.3.12 General Schedule of Operations from Start through Closure*

BVT will commence work outlined in this Plan upon approval by the BLM and issuance of the Permit for Reclamation from the BMRR. BVT anticipates that the proposed exploration activities under this Plan will last approximately three years.

Reclamation activities will be conducted when disturbance is no longer needed. Reclamation will begin within exploration areas considered inactive, without potential, or completed, at the earliest practicable time. Reclamation activities will be coordinated with the BLM and the BMRR, as necessary. The proposed reclamation will be initiated concurrently with the completion of exploration activities. Revegetation is anticipated to take three years after the time of seeding to achieve vegetation success.

#### *2.3.13 Land within the Area of Operation Which Was Affected by the Following:*

2.3.13.1 An Operation Conducted by a Previous Operator and Which is Inactive on the Date on Which the Application for a Permit for an Operation is Filed

None.

2.3.13.2 The Current Operator Before January 1, 1981, and Which is Inactive on the Date on Which the Application for a Permit for an Operation is Filed

None.

2.3.13.3 The Current Operator Before January 1, 1981, and Which is Active on the Date on Which the Application for a Permit for an Operation is Filed

None.

2.3.13.4 The Current Operator On or After January 1, 1981, but Before October 1, 1990, and Which is Inactive on the Date on Which the Application for a Permit for an Operation is Filed

None.

2.3.13.5 The Current Operator On or After January 1, 1981, but Before October 1, 1990, and Which is Active on the Date on Which the Application for Permit for an Operation is Filed

None.

2.3.13.6 The Location of any Surface Water Body within One-Half-Mile Down gradient of the Operation Which May be Impacted by Excess Sedimentation Resulting from the Mining Operations

There is no significant surface water body located within the Project Area boundary; however, there is an intermittent drainage along the eastern portion of the Project Area, from Barton Springs and northward within a half-mile down-gradient of some of the proposed drill sites. Figure 2 displays this drainage feature. In order to prevent potential impacts to the water sources within the Project Area, BVT will create sediment sumps at each drill site to collect drill cuttings and manage drill fluids. Should any drainage be disturbed, it will be reshaped to approach the pre-construction contours. The resulting channels will be of the same capacity as up and downstream reaches and will be made non-erosive by use of surface stabilization techniques (rip-rap from a BLM approved source) where necessary, and ultimately revegetated. Drill sites will not be located within drainage features.

#### *2.3.14 Land within the Operation Area Active On or After October 1, 1990*

Existing surface disturbance within the Project Area that was active on or after October 1, 1990, is outlined in Table 1 and depicted on Figure 2 (Appendix A). BVT has approximately 4.6 acres of existing surface disturbance under Notice N-89713. Currently, BVT has utilized approximately 3.6 acres of Notice-level surface disturbance.

#### *2.3.15 Access Roads Which Were Created before January 1, 1981*

All of the existing access roads (Figure 2) are pre-1981 as determined by reviewing the Como, Nevada 7.5' USGS quadrangle. The Como topographic map was compiled from a 1982 aerial photo and field checked in 1984.

## **2.4 Environmental Protection Measures**

BVT will commit to the following environmental protection measures to prevent unnecessary or undue degradation during construction, operation, and reclamation of the Project. The measures are derived from the general requirements established in BLM's Surface Management Regulations at 43 CFR 3809 and BMRR mining reclamation regulations, as well as other water and air quality regulations.

### *Air Quality*

- Emissions of fugitive dust from disturbed surfaces will be minimized by utilizing appropriate control measures. Surface application of water from a water truck and reduced speed limits on dirt access roads are the current methods of dust control.

### *Cultural Resources*

- Pursuant to 43 CFR 10.4(g), BVT will notify the BLM authorized officer, by telephone, and with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR 10.2). Further pursuant to 43 CFR 10.4 (c) and (d), the operator will immediately stop all activities in the vicinity of the discovery and not commence again for a maximum of 30 days or when notified to proceed by the BLM authorized officer.
- BVT will not knowingly disturb, alter, injure, or destroy any historical or archaeological site, structure, building, or object. If BVT discovers any cultural resource that might be altered or destroyed by operations, the discovery will be left intact and reported to the authorized BLM officer.
- In order to prevent impacts to cultural resources, BVT will avoid eligible or unevaluated cultural sites within the Project Area. BVT will ensure that eligible or unevaluated cultural sites within the Project Area are mapped and flagged by a qualified cultural resource specialist with a global positioning system (GPS) unit prior to surface disturbance.

### *Erosion and Sediment Control*

- Reseeding will be consistent with all BLM recommendations for seed mix constituents, application rate, and seeding methods.
- Final reclamation of constructed roads, sumps, and drill pads will consist of fully re-contouring disturbances to their original grade and reseeded in the fall season immediately following completion of exploration activities.
- Drill pads and sumps will be reclaimed as soon as practicable after completion of data logging and sampling.

### *Fire Management*

- All applicable state and federal fire laws and regulations will be complied with and all reasonable measures will be taken to prevent and suppress fires in the Project Area.
- In the event that the Project should start a fire, BVT will be responsible for all the costs associated with the suppression. The following precautionary measures will be taken to prevent and report wildland fires.
- All vehicles will carry fire extinguishers and a minimum of ten gallons of water.
- Adequate firefighting equipment (i.e., shovel, Pulaski, extinguishers) and a minimum ten gallons of water will be kept at each drill site.

- Vehicle catalytic converters will be inspected often and cleaned of brush and grass debris.
- BVT will conduct welding operations in an area free from or mostly free from vegetation. A minimum of ten gallons of water and a shovel will be on hand to extinguish any fires created from the sparks. Extra personnel will be at the welding site to watch for fires created by welding sparks.
- BVT will report wildland fires immediately to the BLM Sierra Front Interagency Dispatch Center (Minden) at 775 882-9187.
- When conducting operations during the months between May and November, BVT will contact the BLM, Sierra Front Interagency Dispatch Center (Minden) at 775 882-9187 to inquire about any fire restrictions in place for the area of operation and to advise this office of approximate beginning and ending dates for the activities.

#### *Hazardous or Solid Wastes*

- Pursuant to 43 CFR 8365.1-1(b)(3), no sewage, petroleum products, or refuse will be dumped from any trailer or vehicle.
- Only nontoxic fluids will be used in the drilling process.
- Regulated wastes will be removed from the Project Area and disposed of in a state, federal, or local designated area.
- If a spill of a petroleum constituent is considered to meet the reportable quantity per NDEP guidelines (greater than 25 gallons or greater than three cubic yards of impacted material, or any quantity if a water body is impacted), or a reportable quantity for hazardous waste is released based on the Federal Environmental Protection Agency guidelines established under Title III List of Lists (40 CFR Part 302), NDEP will be notified within 24 hours, and the appropriate remedial actions and confirmation sampling will be conducted under direction of NDEP.

#### *Migratory Birds*

- In order to avoid potential impacts to breeding migratory birds, a nest survey will be conducted by a BLM approved biologist prior to any surface disturbance associated with exploration activities during the avian breeding season (March 1 through August 31 for raptors and April 1 through July 31 for other avian species). Pre-disturbance surveys for migratory birds are only valid for fourteen days. If the disturbance for the specific location does not occur within fourteen days of the survey, another survey will be needed. If nests are located, or if other evidence of nesting (i.e., mated pairs, territorial defense, carrying nest material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) will be delineated after consultation with the BLM resource specialist and the buffer area avoided to prevent destruction or disturbance to nests or birds until they are no longer actively breeding or rearing young. The site characteristics to be used to determine the size of the buffer area are as follows: a) topographic screening; b) distance from disturbance to nest; c) the

size and quality of foraging habitat surrounding the nest; d) sensitivity of the species to nest disturbances; and e) the protection status of the species.

#### *Noxious Weeds, Invasive and Nonnative Species*

- Noxious weeds will be controlled through implementation of preventative BMPs and eradication measures if noxious weeds are found.
- To eliminate the transport of vehicle-borne noxious weed seeds, roots, or rhizomes, all vehicles and heavy equipment used for the completion, maintenance, inspection, or monitoring of ground disturbing activities, for emergency fire suppression, or for authorized off-road driving within the Project Area, will be free of soil and debris capable of transporting weed. All such vehicles and equipment will be cleaned with high power or high pressure equipment prior to entering the Project Area. Vehicles and equipment will not drive through known populations of noxious weeds or invasive species following the vehicle washing and prior to entering the Project Area. Vehicles used for emergency fire suppression will be cleaned as part of check-in and demobilization procedures. Cleaning efforts will concentrate on tracks, feet and tires, and on the undercarriage. Special emphasis will be applied to axles, frames, cross members, motor mounts, on and underneath the steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept out and refuse will be disposed of in waste receptacles.

#### *Paleontological Resources*

- BVT will not knowingly disturb, alter, injure, or destroy any scientifically important paleontological deposits. If BVT discovers any paleontological resource that might be altered or destroyed by operations, the discovery will be left intact and reported to the authorized BLM officer.

#### *Public Safety*

- Public safety will be maintained throughout the life of the Project. All equipment and other facilities will be maintained in a safe and orderly manner.
- All sumps and other small excavations that pose a hazard or nuisance to the public, wildlife, or livestock will be adequately fenced to preclude access to them. Activities will be restricted to frozen or dry ground conditions where feasible. Operations will be curtailed when saturated and soft soil conditions exist.
- In the event that any existing roads are severely damaged as a result of BVT activities, BVT will return them to their original condition.

#### *Survey Monuments*

- Any survey monuments, witness corners, or reference monuments will be protected to the extent economically and technically feasible.

### *Water Quality*

- All drill holes will be surveyed and plugged as an operational procedure immediately after completion of drilling in accordance with NAC Chapters 534.4369 and 534.4371. Four drill holes will be collared with a reverse circulation drill rig and completed using a core rig. Once the core rig has completed drilling, the holes will be plugged. Remaining drill holes will be plugged by placing drill cuttings or inorganic fill material into the total depth of the hole, or if ground water was encountered, plugged as a well pursuant to NAC 534.420.
- BVT will follow the Spill Contingency Plan in Appendix D.
- Drill cuttings and fluids will be contained on site utilizing appropriate control measures.
- Sediment traps will be used as necessary and filled at the end of the drill program.

### 3.0 RECLAMATION PLAN

Reclamation will be completed to the standards described in 43 CFR 3809.420 and NAC 519A. Reclamation will meet the reclamation objectives as outlined in the U.S. Department of Interior Solid Minerals Reclamation Handbook #H-3042-1 (BLM 1992), revegetation success standards per BLM/NDEP “Revised Guidelines for Successful Mining and Exploration Revegetation” (BLM 1999), and Surface Management Handbook H-3809-1 (BLM 2012). Existing roads will be utilized as much as possible, minimizing the need for road construction. All BVT drill sites, sumps, and road construction will be re-contoured, decompacted, and reseeded. Concurrent reclamation will be conducted when feasible.

Reclamation will be designed to achieve post-exploration land uses consistent with the BLM's land use management plans for the area. Reclamation is intended to return disturbed land to a level of productivity comparable to pre-exploration levels. Post-exploration land use includes wildlife habitat, livestock grazing, hunting, and dispersed recreation. The post-exploration land use is not expected to differ from pre-exploration land use.

During exploration activities, reclamation will involve management of drilling to contain cuttings and manage drilling fluids, monitoring road conditions, and keeping sites clean and safe. During seasonal closure of the Project and periods of inactivity between drilling phases, reclamation will involve filling sumps, cleaning sites, and maintaining the overall safety of the Project Area. The BLM and BMRR will be notified prior to any periods of inactivity greater than 120 days.

After exploration activities are terminated, reclamation will involve regrading disturbed areas related to this Project to their approximate original contour and seeding using the approved reclamation seed mixture and application rates furnished by the BLM. Yearly visits to the site will be conducted to monitor the success of the revegetation for a period of up to three years or until revegetation success has been achieved.

To prevent and control the introduction and spread of noxious weeds within the Project Area during reclamation activities, BVT will implement the following prevention and control practices:

- Soil (growth media) disturbance will be minimized to the extent practicable, consistent with Project objectives.
- Disturbed sites will be revegetated as soon as practicable when exploration work is completed. Revegetation may include seedbed preparation, seeding, fertilization, and weed-free mulching as necessary.
- The seed mixture will be certified pure live seed and weed free. Straw bales used for erosion control will also be certified as weed free.

Noxious weeds can readily invade disturbed areas associated with exploration projects. BVT will be responsible for the following: 1) identifying noxious weeds in the Project Area (booklets and pamphlets will be provided by the BLM); 2) excluding noxious weeds from disturbed areas until reclamation has been accepted and released; and 3) ensuring that all equipment is “weed free” before traveling to and from the Project Area so that noxious weeds are not spread to new locations.

When noxious weeds are encountered in the Project Area, documentation of their location and extent will be provided to the BLM as soon as possible. BVT will obtain approval from the BLM authorized officer prior to any herbicide application. BVT will contact the BLM’s noxious weed program lead regarding any issues concerning noxious weeds.

To minimize the introduction of noxious weeds into the Project Area, the following preventative measures will be implemented by BVT: 1) all traffic will be confined to existing roads to and from the Project Area and within the Project Area, except for approved cross-county road segments, 2) certified weed-free seed will be used for reclamation, 3) concurrent reclamation will be conducted when feasible, and 4) a weed monitoring and control program will be implemented. The BLM will provide BVT with a color brochure, *Nevada Noxious Weed Field Guide*. BVT will survey the Project Area semi-annually for invasive weed species. If a limited amount of weeds are discovered, they will be pulled, placed in a plastic bag, sealed, and disposed of properly. For more intensive infestations, BVT will consult with the BLM on containment or eradication measures.

The post-exploration and post-reclamation topography will be essentially the same as the pre-exploration topography because only limited amounts of linear surface disturbance are planned.

Exploration activities will occur over approximately three years. All reclamation work, with the exception of revegetation monitoring, will be completed no later than two years after the completion of activities under this Project. BVT will conduct concurrent reclamation of disturbed areas once it is determined that the disturbance is no longer required for Project activities.

Table 3 outlines the anticipated reclamation schedule on a quarterly basis, which will be followed to achieve the reclamation goals set forth above. Revegetation activities are limited by the time of year during which they could be effectively implemented. Site conditions or yearly climatic variations could require that this schedule be modified to achieve revegetation success. Additional reclamation activities include the removal of all equipment, supplies, and materials brought onto public land at the end of the Project life.

**Table 3: Anticipated Reclamation Schedule**

Techniques	Quarter				Year(s)
	1	2	3	4	
	Jan – Mar	April – June	July – Sept	Oct – Dec	
Regrading					Within two years of Project completion
Seeding					Within two years of Project completion
Monitoring					Three years beyond grading and reseeding

Note: Regrading activities could occur year-round

### **3.1 Drill Hole Plugging**

At any given time, no more than four drill holes (i.e., boreholes) will be collared with a reverse circulation drill rig and completed using a core rig. Once the core rig has completed drilling, the holes will be plugged. Remaining drill holes will be plugged by placing drill cuttings or inorganic fill material into the total depth of the hole. In the event that ground water is encountered, drill holes will be plugged pursuant to NAC 534.420.

If casings are set in a borehole, either the boreholes will be completed as wells and plugged pursuant to NAC 534.420 or the casings will be completely removed from the boreholes before they are plugged pursuant to NRS 534, Section 31. The upper portion of the borehole may be permanently cased if the annulus is completely sealed from the casing shoe to the surface pursuant to NAC 534.380. In the event that the upper portion of a borehole is permanently cased, the casing will be perforated, in accordance with NAC 534.420.

### **3.2 Regrading and Reshaping**

Regrading and reshaping of all constructed drill sites, constructed exploration roads, and existing post-January 1, 1981 roads utilized for the Project-related activities will be completed to approximate the original topography as much as practicable. Fill material, enhanced with growth media, will be pulled onto the roadbeds to fill the road cuts and restore the slope to natural contours. Sumps will be backfilled with the stockpiled spoil pile. Reclamation work will be completed with an excavator or dozer, as necessary.

Should any drainage be disturbed, it will be re-shaped to approximate the pre-construction contours. The resulting channels will be of the same capacity as up and downstream reaches and will be made non-erosive by use of surface stabilization techniques (rip-rap) where necessary, and ultimately revegetated. Following completion of earthwork, all disturbed areas will be broadcast seeded.

### **3.3 Mine Reclamation**

Not applicable as this is an exploration project.

### **3.4 Handling of Topsoil**

If there is sufficient topsoil for salvage and reapplication as part of the fill slope of roads and pads, topsoil will be stockpiled and reapplied separately from subsoils. No imported growth media or soil amendments are necessary.

### **3.5 Revegetation**

Generally, seedbed preparation and seeding will take place in the fall after regrading of disturbed areas. All reclaimed areas will be broadcast seeded with a cyclone-type bucket spreader or a mechanical blower. Broadcast seed will be covered by harrowing, raking, or other site-specific appropriate methods, as necessary, to provide seed cover at a depth of ¼ to ½ inch to enhance germination. Reclaimed surfaces will be left in a textured or rough condition (e.g., small humps, pits) to enhance moisture retention and revegetation success while minimizing erosion potential.

The seed list, provided by the BLM and shown in Table 4, is based on known soil and climatic conditions and was selected to establish a plant community that will support the post-exploration land use. The mix is designed to provide species that can exist in the environment of western Nevada, are proven species for revegetation, and/or are native species found in the plant communities prior to disturbance. Broadcast seeding will be at a rate of 13.6 pounds of pure live seed (PLS) per acre. Changes and/or adjustments to the reclamation plant list and/or application rate will be completed in consultation with and approval by the BLM and BMRR.

**Table 4: Anticipated BLM Seed Mix**

Species	Common Name	PLS (lbs/acre)
<i>Leymus cinereus</i>	Great Basin wildrye	3.0
<i>Achnatherum hymenoides</i>	Indian ricegrass	3.0
<i>Achnatherum thurberianum</i>	Thurber needlegrass	3.0
<i>Elymus elymoides</i>	Bottlebrush squirreltail	2.0
<i>Penstemon palmeri</i>	Palmer’s penstemon	1.0
<i>Artemesia tridentata wyomingensis</i>	Wyoming big sagebrush	0.1
<i>Grayia spinosa</i>	Spiny hopsage	1.0
<i>Poa sandbergii</i>	Sandberg bluegrass	0.4
<b>Total</b>		<b>13.5</b>

Timing of revegetation activities is critically important to the overall success of the program. Seeding activities will be timed to take advantage of optimal climatic periods and will be coordinated with other reclamation activities. In general, earthwork and drainage control will be completed in the summer or early fall. Seedbed preparation will generally be completed in the fall, either concurrently with or immediately prior to seeding. Seeds will be sown in late fall to take advantage of winter and spring precipitation and optimum spring germination. Early spring seeding may be utilized for areas not seeded in the fall. In either case, seeding will not be completed when the ground is frozen or snow covered.

**3.6 Isolation, Removal, and/or Control of Acid-Forming, Toxic, or Deleterious Materials**

Refer to Section 5 under the Interim Management Plan.

**3.7 Removal or Stabilization of Building, Structures, and Support Facilities**

No buildings or temporary structures will be built. All equipment and supplies will be removed following completion of the Project. Other materials, including scrap, trash, and unusable equipment, will be removed on a daily or weekly basis and disposed of in accordance with federal and state regulations and laws. In the event that monitoring wells are constructed, the wells will be plugged in accordance with NAC 534.420.

### **3.8 Post-Closure Management**

Post-closure management will commence for all reclaimed areas following completion of the reclamation work. Post-closure management will extend until the reclamation of the site has been accepted by both the BLM and BMRR. For bonding purposes, a three-year post-closure management period is assumed following completion of reclamation construction on any site. For sites reclaimed early in the operations, management of the reclaimed sites will occur concurrently with operational site management. BVT will be required to submit to the BLM and BMRR an Exploration Program Summary Report by April 15 of each year or prior to initiating subsequent construction phases, whichever comes first. This Exploration Program Summary Report will describe all exploration activities that occurred for that year, including all constructed and reclaimed disturbance.

## **4.0 MONITORING PLAN**

Monitoring of the drill sumps includes periodic visual inspections during drill operations to ensure that the drill cuttings are contained. Should the observed condition indicate that the sump containment is inadequate, additional sump capacity will be built and/or incorporated into the drilling fluid management system.

Monitoring associated with reclamation activities is addressed in the Reclamation Plan (Section 3).

Monitoring of drill roads and water bars will include visual inspections, primarily after storm events. If erosion has occurred, or seems likely to occur, the water bars and roads will be repaired using a Caterpillar 325 excavator, or equivalent.

### **4.1 Demonstrate Compliance with the Approved Plan of Operations and Other Federal and State Environmental Laws and Regulations**

The proposed activities outlined in this Plan will be conducted upon BLM and NDEP approval.

### **4.2 Provide Early Detection of Potential Problems**

Not applicable as this is an exploration project.

### **4.3 Supply Information That Would Assist in Directing Corrective Actions Should They Become Necessary**

Not applicable as this is an exploration project.

## **5.0 INTERIM MANAGEMENT PLAN**

The following discussion includes those topics that are pertinent to the planned exploration activities.

### **5.1 Measures to Stabilize Excavations and Workings**

The planned exploration activities do not include mine excavations or workings. The constructed exploration drill roads, pads, and sumps will be maintained in operating condition until reclamation to prevent wash outs and containment breaches.

### **5.2 Measures to Isolate or Control Toxic or Deleterious Materials**

Toxic substances utilized at the Project will include diesel fuel, gasoline, and lubricating grease. Approximately 500 gallons of diesel fuel and gasoline will be stored in fuel delivery systems on the drill rig and support vehicles. Approximately 100 gallons of gasoline will be stored in fuel delivery systems for light vehicles. Approximately ten pounds of lubricating grease will be stored on the drill rigs or transported by drill trucks. In the event that hazardous or regulated materials are spilled, measures will be taken to control the spill, and the BLM and/or the NDEP will be notified as required. Any hazardous substance spills will be handled in accordance with the Spill Contingency Plan (Appendix D), including an immediate clean up and any resulting waste transferred off site in accordance with all applicable local, state, and federal regulations. Contract drillers will maintain spill kits on site for use in case of a spill.

### **5.3 Provisions for the Storage or Removal of Equipment, Supplies and Structures**

During extended periods of nonoperation or seasonal closure of the exploration activities, all exploration equipment and supplies will be moved from the Project Area.

### **5.4 Measures to Maintain the Project Area in a Safe and Clean Condition**

BVT will conduct regular, periodic inspections of the exploration areas and activities. As a matter of normal practice, all trash will be hauled off site, and there will be no exploration materials left on site. All drill sites will be patrolled with a hand rake and shovel after Project completion to scatter and cover any cuttings piles, fill ruts, and to perform general clean up.

### **5.5 Plans for Monitoring Site Conditions During Periods of Nonoperation**

The measures outlined in Section 5.4 will be conducted during periods of nonoperation, except as limited by weather conditions.

### **5.6 A Schedule of Anticipated Periods of Temporary Closure During Which BVT Would Implement the Interim Management Plan, Including Provisions for Notifying BLM and NDEP of Unplanned or Extended Temporary Closures**

Periods of non-operation are not anticipated as part of the Project. Operations will take place up to 24 hours per day, seven days per week, except during periods of scheduled drilling breaks. Should periods of temporary closure or nonoperation occur, BVT will notify the BLM and NDEP verbally and in writing. Periods of temporary closure or nonoperation could be caused by severe winter

weather conditions, such as significant drifting snow or deep snow.

**5.7 In Cases of Temporary or Seasonal Closure, BVT Must Provide Adequate Maintenance, Monitoring, Security, and Financial Guarantee, and BLM May Require BVT to Detoxify Process Solutions**

Not applicable as this is an exploration project.

## **6.0 STATEMENT OF ASSUMPTION OF RECLAMATION RESPONSIBILITY**

BVT agrees to accept the responsibility for reclamation of all surface disturbance associated with the Project detailed in this Plan.

## 7.0 RECLAMATION COST ESTIMATE

The reclamation cost estimate (Appendix C), as required by 43 CFR 3809.552, is attached to this Plan. The official Nevada Standardized Reclamation Cost Estimator (SRCE) software that was developed in accordance with the Nevada Standardized Unit Cost Project, a cooperative effort between the NDEP, the BLM, and the Nevada Mining Association (NvMA) to facilitate accuracy, completeness, and consistency in the calculation of costs for mine site reclamation was used to estimate the cost of reclamation.

The statewide bond will be posted to cover the total reclamation cost associated with this Plan based on the SRCE Calculator upon receiving concurrence from the BLM and BMRR that the amount is satisfactory.

The RCE was created to provide an estimate for the cost of the reclamation portion of the Project. In addition to the cost, the RCE also identifies proposed exploration and associated roads and pads, monitoring, and mobilization and demobilization of equipment to the Project Area. Within the RCE, there are subsections that explain the processes that are outlined in the Plan from an economic perspective. The subsections of importance in the RCE are listed and defined as follows:

- Exploration – This subsection describes the exploration drill holes in detail, as well as the means of installation and abandonment;
- Exploration Roads and Pads – This subsection lists the descriptions for various proposed roads to exploration drill sites. This section also states the type of revegetation equipment and materials used for reclamation of the disturbed roads and drill sites;
- Monitoring – This subsection of the RCE includes the maintenance of the revegetation of the Project Area, as well as the personnel who will observe and report the status of the revegetation and reclamation practices;
- Mobilization and Demobilization – This subsection relates to the cost of transporting, loading, and unloading of equipment, that are required for reclamation activities to and from the Project Area.

## **8.0 PERMIT APPLICATION FEE**

The State Application for Reclamation Permit fee is structured such that different rates are used to calculate the fee based on the total affected acres (acres of surface disturbance) and the type of application (new, minor modification, and major modification). The Project will affect approximately 22.62 acres. A check in the amount of \$16.35 is enclosed with this application (\$1.50 per acre public x 22.62 acres = \$33.93). The check is made payable to the State of Nevada, Division of Environmental Protection.

## **9.0 EFFECT OF PROPOSED RECLAMATION ON PUBLIC SAFETY**

No unnatural hazards will exist during or after reclamation in the disturbed/reclaimed areas.

## 10.0 ACKNOWLEDGMENTS

It is understood that should the nature of the operation change, a modified or supplemental plan of operations and reclamation may be required.

It is understood that approval of this Plan of Operations does not constitute: 1) certification of ownership to any person named herein; and 2) recognition of the validity of any mining claim herein.

It is understood that a bond equivalent to the actual cost of performing the agreed upon reclamation measures will be required before this Plan of Operations can be approved. Bonding and any bond reduction amounts will be set on a site-specific basis by the lead agency in coordination with the cooperating agencies.

It is understood that approval of this Plan of Operations does not relieve the undersigned of responsibility to comply with any other applicable state or federal laws, rules, or regulations.

It is understood that any information provided with this Plan of Operations that is marked confidential will be treated by the agency in accordance with that agency's laws, rules, and regulations.

On behalf of Bonaventure Nevada, Inc., I have reviewed and agree to comply with all conditions in this Plan of Operations. I understand that the bond will not be released until the state agency in charge gives written approval of the reclamation work. I further understand that all fees required to be paid annually to the State of Nevada, are to be paid until such time as written approval of the reclamation work has either been provided to the state or the state has given its own approval.

**Bonaventure Nevada, Inc.**

By: \_\_\_\_\_

Date: \_\_\_\_\_

*Richard Kem*  
*President and Director*

## 11.0 REFERENCES

Bureau of Land Management (BLM). 1992. *Solid Minerals Reclamation Handbook #H-3042-1*.

Bureau of Land Management (BLM). 1999. *Revised Guidelines for Successful Mining and Exploration Revegetation*.

Bureau of Land Management (BLM). 2012. *Surface Management Handbook*. BLM Manual Handbook H-3809-1.

Nevada State Conservation Commission. 1994. *Best Management Practices Handbook*.  
<http://www.cicacenter.org/pdf/NVBMPHandbook>

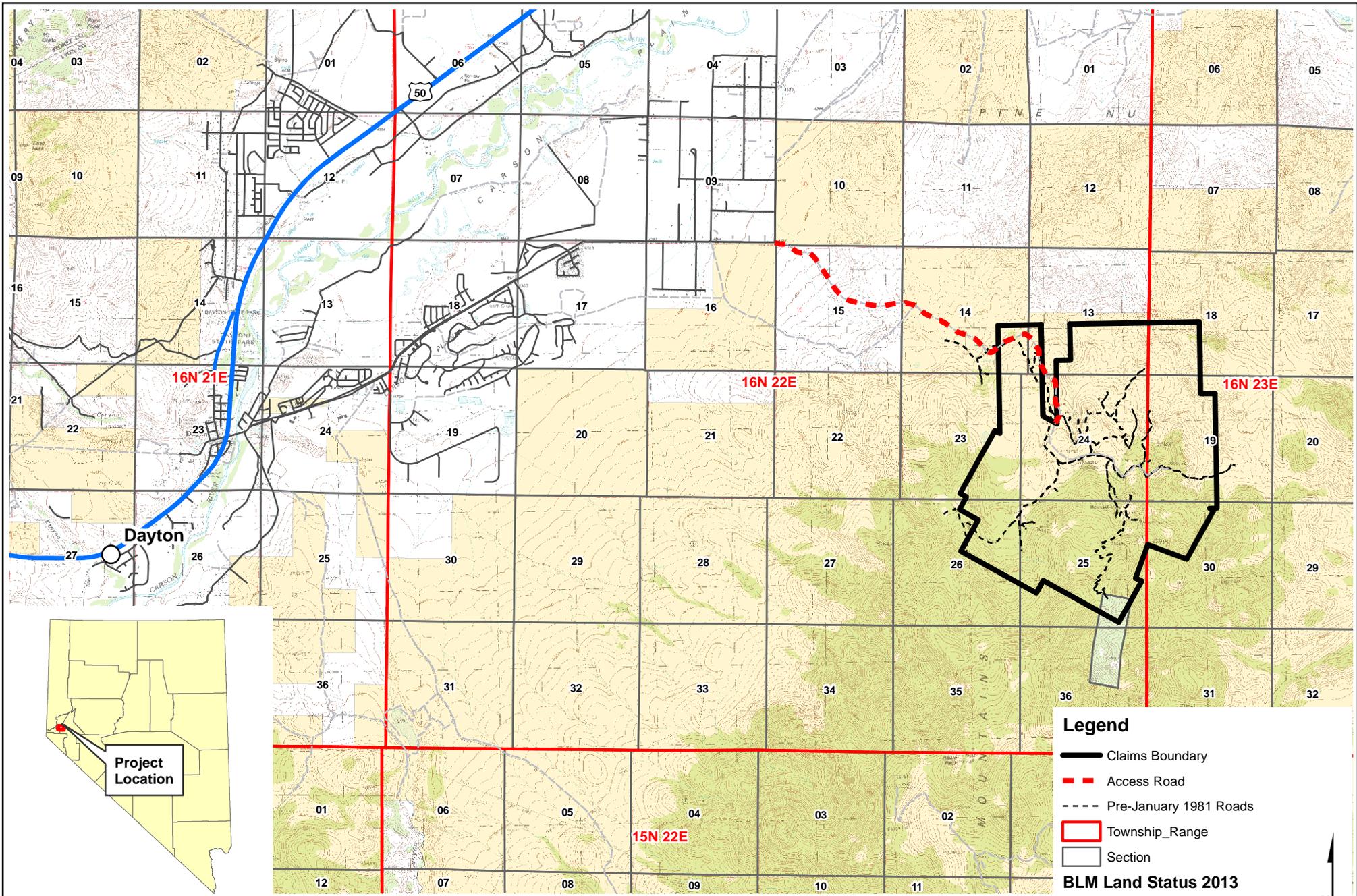
Nevada Standardized Reclamation Cost Estimator (SRCE) software developed in accordance with the Nevada Standardized Unit Cost Project, a cooperative effort between the NDEP, the BLM, and the Nevada Mining Association. 2012.

# Appendix A

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Figure 1. Hercules Project Location, Access, and Land Status Map

Figure 2. Existing and Proposed Disturbance

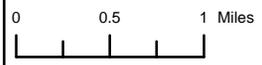


**Legend**

- Claims Boundary
- Access Road
- Pre-January 1981 Roads
- Township\_Range
- Section

**BLM Land Status 2013**

- Bureau of Land Management
- Private



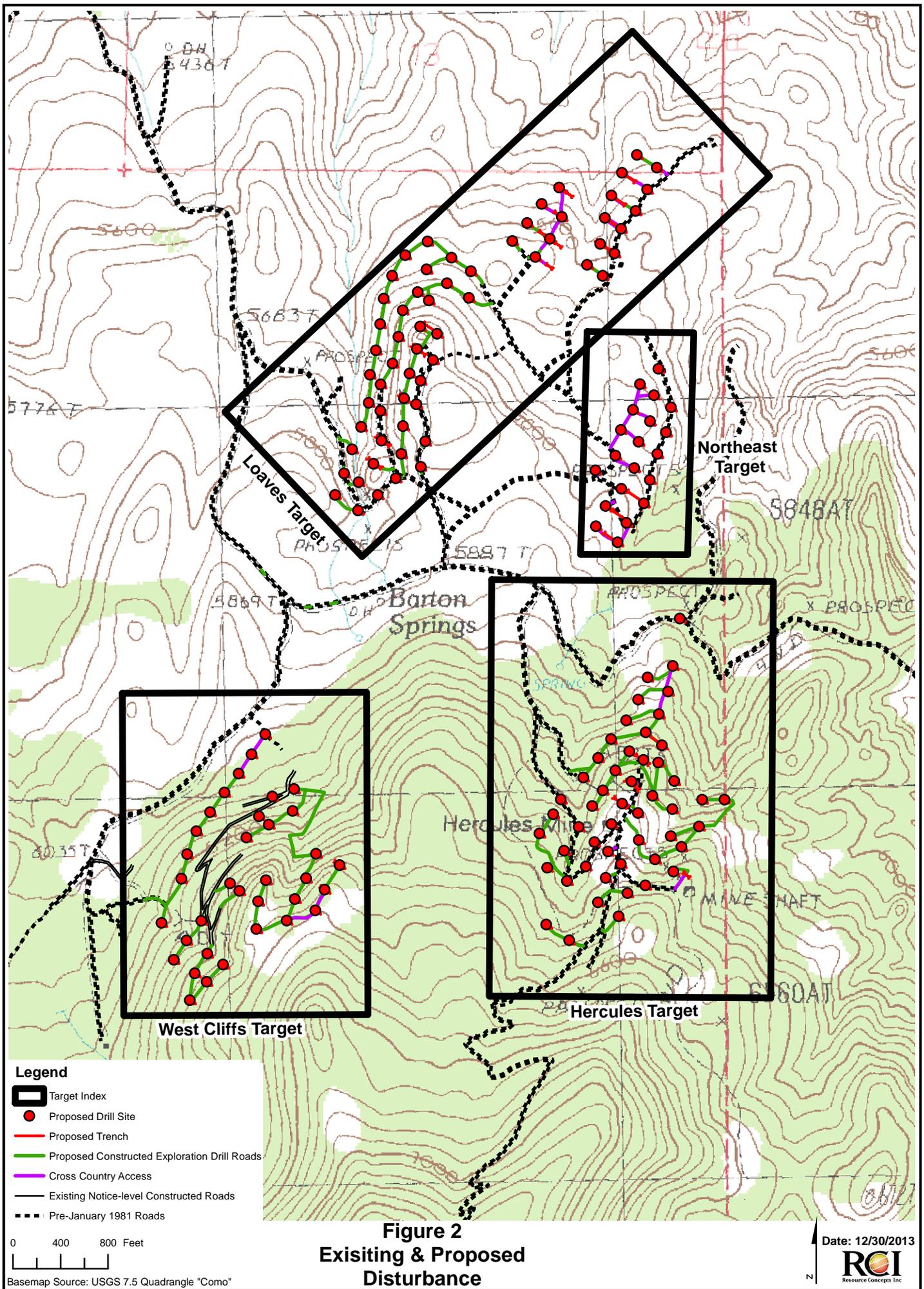
Basemap Source:  
 USGS 7.5 Minute Quadrangles "Dayton",  
 "Flowery Peak", "Como", "Misfits Flat"

Path: R:\projects\MinQuest\MXD\Report\_Figures\_12\_23\_13\Figure\_1.mxd

**Figure 1**  
**Hercules Project Location, Access,**  
**and Land Status Map**

Date: 12/30/2013





- Legend**
- Target Index
  - Proposed Drill Site
  - Proposed Trench
  - Proposed Constructed Exploration Drill Roads
  - Cross Country Access
  - Existing Notice-level Constructed Roads
  - Pre-January 1981 Roads

0 400 800 Feet

**Figure 2**  
**Existing & Proposed**  
**Disturbance**

Date: 12/30/2013

Basemap Source: USGS 7.5 Quadrangle "Como"  
 Path: R:\projects\MinQuest\MXD\Report\_Figures\_12\_23\_13\Figure\_2.mxd

# **Appendix B**

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Claim Information

## Project Claims and Serial Numbers

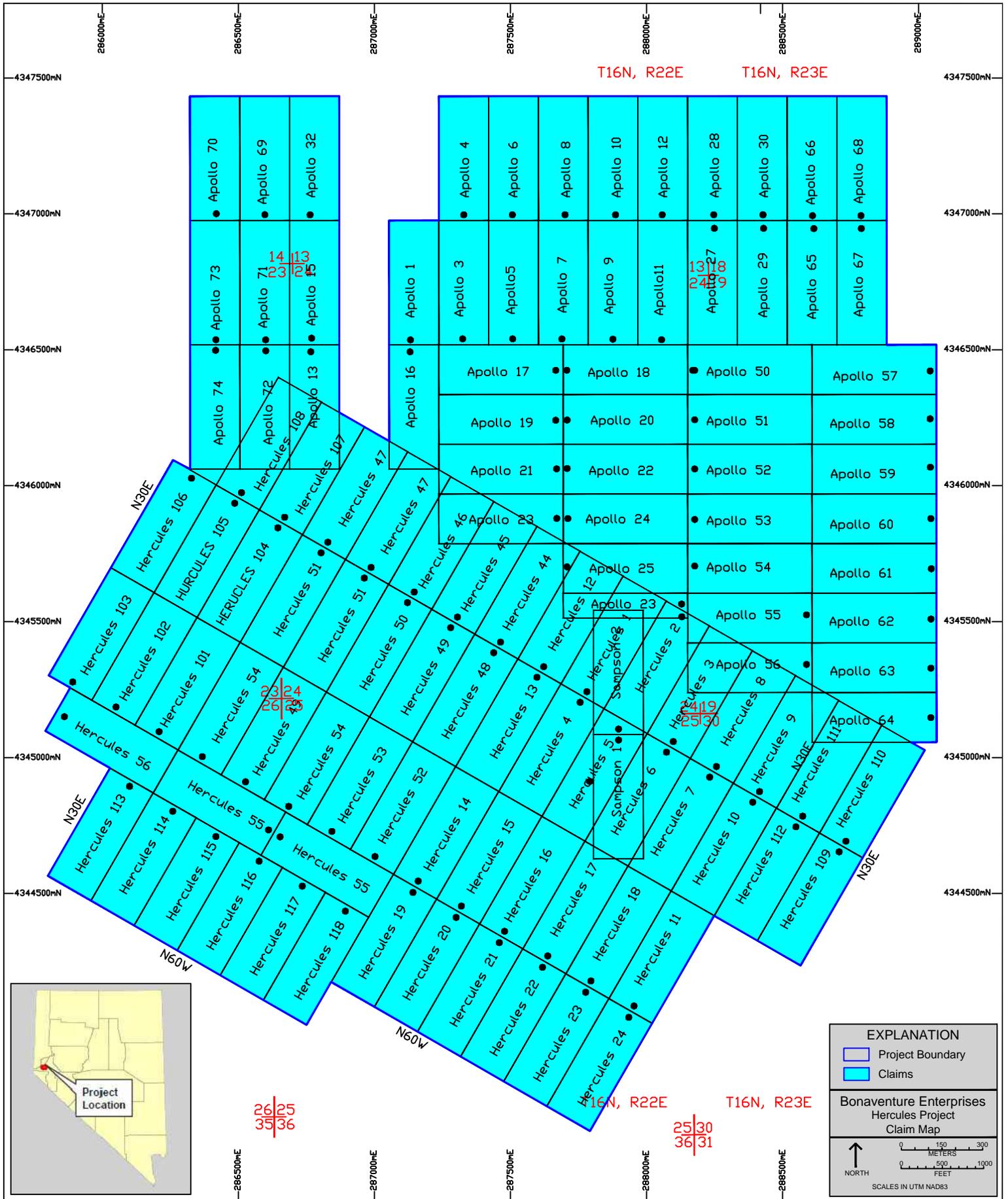
Claim Name	BLM Serial Number	Claimant	Township	Range	Section	Quadrant
Hercules 2	804978	MinQuest Inc	16N	22E	24	SE ¼
			16N	22E	25	NE ¼
			16N	23E	19	SW ¼
Hercules 3	804979	MinQuest Inc	16N	22E	24	SE ¼
			16N	22E	25	NE ¼
			16N	23E	19	SW ¼
			16N	23E	30	NW ¼
Hercules 48	804984	MinQuest Inc	16N	22E	24	SW ¼
			16N	22E	24	SE ¼
			16N	22E	25	NW ¼
Hercules 49	804985	MinQuest Inc	16N	22E	24	SW ¼
			16N	22E	25	NW ¼
Hercules 52	804987	MinQuest Inc	16N	22E	25	NW ¼
Hercules 53	804988	MinQuest Inc	16N	22E	25	NW ¼
Hercules 1	832290	MinQuest Inc	16N	22E	24	SE ¼
Hercules 4	832291	MinQuest Inc	16N	22E	24	SE ¼
			16N	22E	25	NE ¼
Hercules 5	832292	MinQuest Inc	16N	22E	25	NE ¼
Hercules 6	832293	MinQuest Inc	16N	22E	25	NW ¼
Hercules 7	832294	MinQuest Inc	16N	22E	25	NE ¼
			16N	23E	30	NW ¼
Hercules 8	832295	MinQuest Inc	16N	22E	25	NE ¼
			16N	23E	19	SW ¼
			16N	23E	30	NW ¼
Hercules 12	832296	MinQuest Inc	16N	22E	24	SE ¼
Hercules 13	832297	MinQuest Inc	16N	22E	24	SE ¼
			16N	22E	25	NE ¼
			16N	22E	25	NW ¼
Hercules 14	832298	MinQuest Inc	16N	22E	25	NE ¼
			16N	22E	25	NW ¼
Hercules 19	832299	MinQuest Inc	16N	22E	25	NW ¼
			16N	22E	25	SW ¼
Hercules 44	832300	MinQuest Inc	16N	22E	24	SW ¼
			16N	22E	24	SE ¼
Hercules 45	832301	MinQuest Inc	16N	22E	24	SW ¼
			16N	22E	24	SE ¼
Hercules 46	832302	MinQuest Inc	16N	22E	24	SW ¼
			16N	22E	24	SE ¼
Hercules 47	832303	MinQuest Inc	16N	22E	24	NW ¼
			16N	22E	24	SW ¼
Hercules 50	832304	MinQuest Inc	16N	22E	24	SW ¼
			16N	22E	25	NW ¼
Hercules 51	832305	MinQuest Inc	16N	22E	24	SW ¼
Hercules 54	832306	MinQuest Inc	16N	22E	24	SW ¼
			16N	22E	25	NW ¼
			16N	22E	26	NE ¼
Hercules 55	832307	MinQuest Inc	16N	22E	26	SE ¼
			16N	22E	25	NW ¼

Apollo 24	905401	MinQuest Inc	16N	22E	24	SE ¼
Apollo 7	905402	MinQuest Inc	16N	22E	13	SE ¼
			16N	22E	24	NE ¼
Apollo 16	905403	MinQuest Inc	16N	22E	24	NW ¼
Apollo 17	905404	MinQuest Inc	16N	22E	24	NE ¼
			16N	22E	24	NW ¼
Apollo 19	905405	MinQuest Inc	16N	22E	24	NE ¼
			16N	22E	24	NW ¼
Apollo 21	905406	MinQuest Inc	16N	22E	24	NE ¼
			16N	22E	24	NW ¼
			16N	22E	24	SW ¼
			16N	22E	24	SE ¼
Apollo 1	832280	MinQuest Inc	16N	22E	13	SW ¼
			16N	22E	24	NW ¼
Apollo 3	832281	MinQuest Inc	16N	22E	13	SW ¼
			16N	22E	24	NW ¼
Apollo 5	832282	MinQuest Inc	16N	22E	13	SW ¼
			16N	22E	13	SE ¼
			16N	22E	24	NE ¼
			16N	22E	24	NW ¼
Apollo 9	832283	MinQuest Inc	16N	22E	13	SE ¼
			16N	22E	24	NE ¼
Apollo 11	832284	MinQuest Inc	16N	22E	13	SE ¼
			16N	22E	24	NE ¼
Apollo 18	832285	MinQuest Inc	16N	22E	24	NE ¼
Apollo 20	832286	MinQuest Inc	16N	22E	24	NE ¼
Apollo 22	832287	MinQuest Inc	16N	22E	24	NE ¼
			16N	22E	24	SE ¼
Apollo 23	832288	MinQuest Inc	16N	22E	24	SW ¼
			16N	22E	24	SE ¼
Apollo 25	832289	MinQuest Inc	16N	22E	24	SE ¼
Apollo 4	1003135	MinQuest Inc	16N	22E	13	SW ¼
Apollo 6	1003136	MinQuest Inc	16N	22E	13	SW ¼
			16N	22E	13	SE ¼
Apollo 8	1003137	MinQuest Inc	16N	22E	13	SE ¼
Apollo 10	1003138	MinQuest Inc	16N	22E	13	SE ¼
Apollo 12	1003139	MinQuest Inc	16N	22E	13	SE ¼
Apollo 50	1003140	MinQuest Inc	16N	22E	24	NE ¼
			16N	23E	19	NW ¼
Apollo 51	1003141	MinQuest Inc	16N	22E	24	NE ¼
			16N	23E	19	NW ¼
Apollo 52	1003142	MinQuest Inc	16N	22E	24	NE ¼
			16N	22E	24	SE ¼
			16N	23E	19	NW ¼
			16N	23E	19	SW ¼
Apollo 53	1003143	MinQuest Inc	16N	22E	24	SE ¼
			16N	23E	19	SW ¼
Apollo 54	1003144	MinQuest Inc	16N	22E	24	SE ¼
			16N	23E	19	SW ¼
Apollo 55	1003145	MinQuest Inc	16N	22E	24	SE ¼
			16N	23E	19	SW ¼

Apollo 56	1003146	MinQuest Inc	16N	22E	24	SE ¼
			16N	23E	19	SW ¼
Apollo 23	1003147	MinQuest Inc	16N	22E	24	SE ¼
Hercules 47	1003148	MinQuest Inc	16N	22E	24	NW ¼
			16N	22E	24	SW ¼
Hercules 51	1003150	MinQuest Inc	16N	22E	22	NE ¼
			16N	22E	23	SW ¼
Hercules 54	1003151	MinQuest Inc	16N	22E	23	NE ¼
			16N	22E	24	SW ¼
			16N	22E	26	SE ¼
Hercules 55	1003152	MinQuest Inc	16N	22E	25	NW ¼
			16N	22E	26	SE ¼
Apollo 57	1038721	MinQuest Inc	16N	23E	19	NW ¼
			16N	23E	19	NE ¼
Apollo 58	1038722	MinQuest Inc	16N	23E	19	NW ¼
			16N	23E	19	NE ¼
Apollo 59	1038723	MinQuest Inc	16N	23E	19	NW ¼
			16N	23E	19	NE ¼
			16N	23E	19	SW ¼
			16N	23E	19	SE ¼
Apollo 60	1038724	MinQuest Inc	16N	23E	19	SW ¼
			16N	23E	19	SE ¼
Apollo 61	1038725	MinQuest Inc	16N	23E	19	SW ¼
			16N	23E	19	SE ¼
Apollo 62	1038726	MinQuest Inc	16N	23E	19	SW ¼
			16N	23E	19	SE ¼
Apollo 63	1038727	MinQuest Inc	16N	23E	19	SW ¼
			16N	23E	19	SE ¼
Apollo 64	1038728	MinQuest Inc	16N	23E	19	SW ¼
			16N	23E	19	SE ¼
			16N	23E	30	NW ¼
			16N	23E	30	NE ¼
Apollo 65	1038729	MinQuest Inc	16N	23E	18	SW ¼
			16N	23E	19	NW ¼
Apollo 66	1038730	MinQuest Inc	16N	23E	18	SW ¼
Apollo 67	1038731	MinQuest Inc	16N	23E	18	SW ¼
			16N	23E	19	NW ¼
Apollo 68	1038732	MinQuest Inc	16N	23E	18	SW ¼
Apollo 69	1038733	MinQuest Inc	16N	22E	14	SE ¼
Apollo 70	1038734	MinQuest Inc	16N	22E	14	SE ¼
Apollo 71	1038735	MinQuest Inc	16N	22E	14	SE ¼
			16N	22E	22	NE ¼
Apollo 72	1038736	MinQuest Inc	16N	22E	23	NE ¼
Apollo 73	1038737	MinQuest Inc	16N	22E	14	SE ¼
			16N	22E	22	NE ¼
Apollo 74	1038738	MinQuest Inc	16N	22E	23	NE ¼
Hercules 56	1038739	MinQuest Inc	16N	22E	23	SW ¼
			16N	22E	23	SW ¼
			16N	22E	26	NE ¼
			16N	22E	26	NW ¼
Hercules 101	1038740	MinQuest Inc	16N	22E	23	SE ¼

			16N	22E	26	NE ¼
Hercules 102	1038741	MinQuest Inc	16N	22E	23	SE ¼
			16N	22E	26	NE ¼
Hercules 103	1038742	MinQuest Inc	16N	22E	23	SW ¼
			16N	22E	23	SE ¼
			16N	22E	26	NE ¼
			16N	22E	26	NW ¼
Hercules 104	1038743	MinQuest Inc	16N	22E	23	SE ¼
			16N	22E	24	SW ¼
Hercules 105	1038744	MinQuest Inc	16N	22E	23	SE ¼
Hercules 106	1038745	MinQuest Inc	16N	22E	23	NE ¼
			16N	22E	23	SE ¼
Hercules 107	1038746	MinQuest Inc	16N	22E	23	NE ¼
			16N	22E	23	SW ¼
			16N	22E	24	NW ¼
			16N	22E	24	SW ¼
Hercules 108	1038747	MinQuest Inc	16N	22E	23	NE ¼
			16N	22E	23	SE ¼
			16N	22E	24	NW ¼
Hercules 109	1038748	MinQuest Inc	16N	23E	30	NW ¼
			16N	23E	30	SW ¼
Hercules 110	1038749	MinQuest Inc	16N	23E	30	NW ¼
Sampson 1	27290	MinQuest Inc	16N	22E	24	SE ¼
			16N	22E	25	NE ¼
Sampson 2	27287	MinQuest Inc	16N	22E	25	NE ¼
Apollo 13	1089785	MinQuest Inc	16N	22E	23	NE ¼
			16N	22E	24	NW ¼
Apollo 15	1089786	MinQuest Inc	16N	22E	13	SW ¼
			16N	22E	14	SE ¼
			16N	22E	23	NE ¼
			16N	22E	24	NW ¼
Apollo 27	1089787	MinQuest Inc	16N	22E	13	SE ¼
			16N	22E	24	NE ¼
			16N	23E	18	SW ¼
			16N	23E	19	NW ¼
Apollo 28	1089788	MinQuest Inc	16N	22E	13	SE ¼
			16N	23E	18	SW ¼
Apollo 29	1089789	MinQuest Inc	16N	23E	18	SW ¼
			16N	23E	19	NW ¼
Apollo 30	1089790	MinQuest Inc	16N	23E	18	SW ¼
Apollo 32	1089791	MinQuest Inc	16N	22E	13	SW ¼
			16N	22E	14	SE ¼
Hercules 100	1089792	MinQuest Inc	16N	22E	23	SE ¼
			16N	22E	24	SW ¼
			16N	22E	25	NW ¼
			16N	22E	26	NE ¼
Hercules 9	1089793	MinQuest Inc	16N	23E	19	SW ¼
			16N	23E	30	NW ¼
Hercules 10	1089794	MinQuest Inc	16N	22E	25	NE ¼
			16N	23E	30	NW ¼
Hercules 17	1089795	MinQuest Inc	16N	22E	25	NE ¼

			16N	22E	25	SE ¼
Hercules 22	1089796	MinQuest Inc	16N	22E	25	SW ¼
			16N	22E	25	SE ¼
Hercules 111	1089797	MinQuest Inc	16N	23E	19	SW ¼
			16N	23E	30	NW ¼
Hercules 112	1089798	MinQuest Inc	16N	23E	30	NW ¼
			16N	23E	30	SW ¼
Hercules 11	1089799	MinQuest Inc	16N	22E	25	NE ¼
			16N	22E	25	SE ¼
			16N	23E	30	NW ¼
			16N	23E	30	SW ¼
Hercules 15	1089800	MinQuest Inc	16N	22E	25	NE ¼
			16N	22E	25	NW ¼
			16N	22E	25	SW ¼
			16N	22E	25	SE ¼
Hercules 16	1089801	MinQuest Inc	16N	22E	25	NE ¼
			16N	22E	25	SW ¼
			16N	22E	25	SE ¼
Hercules 18	1089802	MinQuest Inc	16N	22E	25	NE ¼
			16N	22E	25	SE ¼
Hercules 20	1089803	MinQuest Inc	16N	22E	25	NW ¼
			16N	22E	25	SW ¼
Hercules 21	1089804	MinQuest Inc	16N	22E	25	SW ¼
			16N	22E	25	SE ¼
Hercules 23	1089805	MinQuest Inc	16N	22E	25	SE ¼
Hercules 24	1089806	MinQuest Inc	16N	22E	25	SE ¼
			16N	22E	36	NE ¼
Hercules 113	1089807	MinQuest Inc	16N	22E	26	NE ¼
			16N	22E	26	NW ¼
			16N	22E	26	SW ¼
			16N	22E	26	SE ¼
Hercules 114	1089808	MinQuest Inc	16N	22E	26	NE ¼
			16N	22E	26	SE ¼
Hercules 115	1089809	MinQuest Inc	16N	22E	26	NE ¼
			16N	22E	26	SE ¼
Hercules 116	1089810	MinQuest Inc	16N	22E	25	NW ¼
			16N	22E	26	NE ¼
			16N	22E	26	SE ¼
Hercules 117	1089811	MinQuest Inc	16N	22E	25	NW ¼
			16N	22E	25	SW ¼
			16N	22E	26	SE ¼
			16N	22E	26	SE ¼
Hercules 118	1089812	MinQuest Inc	16N	22E	25	NW ¼
			16N	22E	25	SW ¼
			16N	22E	26	SE ¼



**EXPLANATION**

- Project Boundary
- Claims

**Bonaventure Enterprises  
Hercules Project  
Claim Map**

↑  
NORTH

0 150 300  
METERS

0 500 1000  
FEET

SCALES IN UTM NAD83

# Appendix C

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Reclamation Cost Estimate

Closure Cost Estimate  
Property Information

Enter Data Below in Green and Blue Spaces

STANDARDIZED RECLAMATION COST ESTIMATOR

Version 1.4.1  
Build 017

Approved for use in Nevada, August 1, 2012

COST DATA FILE INFORMATION

File Name: 2014 08 12 MiinquestCopy of SRCE\_Version\_1\_4\_1\_017\_NV\_2013\_costs sa.xlsm  
Cost Data File: SRCE\_Cost\_Data\_File\_1\_12\_Std\_2013.xlsm  
Cost Data Date: August 1, 2013  
Cost Data Basis: User Data Data Cost Units: Imperial  
Author/Source: Nevada Division of Environmental Protection (NDEP) & NV BLM

PROJECT INFORMATION

Property/Mine Name: Bonaventure Nevada, Inc. Property Code:  
Project Name: Hercules Project  
Date of Submittal: 8-13-14 Average Altitude: 6000 ft.  
Select One:  Notice or Sm Exploration Plan  Lg Exploration Plan  Mine Operation  
Select One:  Private Land  Public or Public/Private  
Cost Estimate Type: Surety  
Cost Basis Category: Northern Nevada  
Churchill, Douglas, Elko, Eureka, Humboldt, Lander, Lyon, Mineral, Pershing, Storey, Washoe, and White Pine Counties  
Cost Basis Description:

**Closure Cost Estimate  
Cost Summary**

Project Name: Hercules Project

Project Date: 8-13-14

Model Version: Version 1.4.1

File Name: 2014 08 12 MiinquestCopy of SRCE\_Version\_1\_4\_1\_017\_NV\_2013\_costs sa.xlsxm

<b>A. Earthwork/Recontouring</b>	<b>Labor (1)</b>	<b>Equipment (2)</b>	<b>Materials</b>	<b>Total</b>
Exploration	\$4,425	\$6,492	\$20	\$10,937
Exploration Roads & Drill Pads	\$6,904	\$13,760	\$0	\$20,664
Roads	\$0	\$0	\$0	\$0
Well Abandonment	\$0	\$0	\$0	\$0
Pits	\$0	\$0	N/A	\$0
Quarries & Borrow Areas	\$0	\$0	\$0	\$0
Underground Openings	\$0	\$0	\$0	\$0
Process Ponds	\$0	\$0	\$0	\$0
Heaps	\$0	\$0	\$0	\$0
Waste Rock Dumps	\$0	\$0	\$0	\$0
Landfills	\$0	\$0	\$0	\$0
Tailings	\$0	\$0	\$0	\$0
Foundation & Buildings Areas	\$0	\$0	\$0	\$0
Yards, Etc.	\$58	\$126	\$0	\$184
Drainage & Sediment Control	\$0	\$0	\$0	\$0
Generic Material Hauling	\$0	\$0	\$0	\$0
Other User Costs (from Other User sheet)	\$0	\$0	\$0	\$0
Other**				\$0
<b>Subtotal</b>	<b>\$11,387</b>	<b>\$20,378</b>	<b>\$20</b>	<b>\$31,785</b>
Mob/Demob if included in Other User sheet	\$0	\$0	\$0	\$0
Mob/Demob	\$685	\$685		\$1,370
<b>Subtotal "A"</b>	<b>\$12,072</b>	<b>\$21,063</b>	<b>\$20</b>	<b>\$33,155</b>
<b>B. Revegetation/Stabilization</b>	<b>Labor (1)</b>	<b>Equipment (2)</b>	<b>Materials</b>	<b>Total</b>
Exploration	\$70	\$30	\$290	\$390
Exploration Roads & Drill Pads	\$1,288	\$552	\$6,450	\$8,290
Roads	\$0	\$0	\$0	\$0
Well Abandonment				N/A
Pits	\$0	\$0	\$0	\$0
Quarries & Borrow Areas	\$0	\$0	\$0	\$0
Underground Openings				N/A
Process Ponds	\$0	\$0	\$0	\$0
Heaps	\$0	\$0	\$0	\$0
Waste Rock Dumps	\$0	\$0	\$0	\$0
Landfills	\$0	\$0	\$0	\$0
Tailings	\$0	\$0	\$0	\$0
Foundation & Buildings Areas	\$0	\$0	\$0	\$0
Yards, Etc.	\$70	\$30	\$73	\$173
Drainage & Sediment Control	\$0	\$0	\$0	\$0
Generic Material Hauling	\$0	\$0	\$0	\$0
Other User Costs (from Other User sheet)	\$0	\$0	\$0	\$0
Other**				\$0
<b>Subtotal "B"</b>	<b>\$1,428</b>	<b>\$612</b>	<b>\$6,813</b>	<b>\$8,853</b>
<b>C. Detoxification/Water Treatment/Disposal of Wastes**</b>	<b>Labor (1)</b>	<b>Equipment (2)</b>	<b>Materials</b>	<b>Total</b>
Process Ponds/Sludge				\$0
Heaps				\$0
Dumps (Waste & Landfill)				\$0
Tailings				\$0
Surplus Water Disposal				\$0
Monitoring				\$0
Miscellaneous				\$0
Solid Waste - On Site	\$0	\$0	N/A	\$0
Solid Waste - Off Site				\$0
Hazardous Materials				\$0
Hydrocarbon Contaminated Soils	\$0	\$0	\$0	\$0
Other User Costs (from Other User sheet)	\$0	\$0	\$0	\$0
Other**				\$0
<b>Subtotal "C"</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>D. Structure, Equipment and Facility Removal, and Misc.</b>	<b>Labor (1)</b>	<b>Equipment (2)</b>	<b>Materials</b>	<b>Total</b>
Foundation & Buildings Areas	\$0	\$0	\$0	\$0
Other Demolition	\$0	\$0	\$0	\$0
Equipment Removal	\$0	\$0	\$0	\$0
Fence Removal	\$0	\$0	\$0	\$0
Fence Installation	\$0	\$0	\$0	\$0
Culvert Removal	\$0	\$0	N/A	\$0
Pipe Removal	\$0	\$0	N/A	\$0
Powerline Removal	\$0			\$0
Transformer Removal	\$0			\$0
Rip-rap, rock lining, gabions	\$0	\$0	\$0	\$0
Other Misc. Costs	\$0	\$0	\$0	\$0
Other User Costs (from Other User sheet)	\$0	\$0	\$0	\$0
Other**				\$0
<b>Subtotal "D"</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>E. Monitoring</b>	<b>Labor (1)</b>	<b>Equipment (2)</b>	<b>Materials</b>	<b>Total</b>
Reclamation Monitoring and Maintenance	\$3,300	\$345	\$0	\$3,645
Ground and Surface Water Monitoring	\$0	\$0	\$0	\$0
Other User Costs (from Other User sheet)	\$0	\$0	\$0	\$0
<b>Subtotal "E"</b>	<b>\$3,300</b>	<b>\$345</b>	<b>\$0</b>	<b>\$3,645</b>
<b>F. Construction Management &amp; Support</b>	<b>Labor</b>	<b>Equipment (2)</b>	<b>Materials</b>	<b>Total</b>
Construction Management	\$0	\$0	N/A	\$0
Construction Support	\$0	\$0	\$0	\$0
Road Maintenance	\$0	\$0	\$0	\$0
Other User Costs (from Other User sheet)	\$0	\$0	\$0	\$0
Other**				\$0
<b>Subtotal "F"</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Subtotal Operational &amp; Maintenance Costs</b>	<b>Labor (1)</b>	<b>Equipment (2)</b>	<b>Materials (3)</b>	<b>Total</b>
<b>Subtotal A through F</b>	<b>\$16,800</b>	<b>\$22,020</b>	<b>\$6,833</b>	<b>\$45,653</b>

\*\* Other Operator supplied costs - additional documentation required.

**Closure Cost Estimate  
Cost Summary**

**Project Name: Hercules Project**

**Project Date: 8-13-14**

**Model Version: Version 1.4.1**

**File Name: 2014 08 12 MiinquestCopy of SRCE\_Version\_1\_4\_1\_017\_NV\_2013\_costs sa.xlsm**

Indirect Costs	Include?	Total
1. Engineering, Design and Construction (ED&C) Plan (7)		\$3,652
2. Contingency (8)		\$4,565
3. Insurance (9)	\$252	\$252
4. Performance Bond (10)		N/A
5. Contractor Profit (11)		\$4,565
6. Contract Administration (12)		\$4,565
7. Government Indirect Cost (13)		\$959
<b>Subtotal Add-On Costs</b>		<b>\$18,558</b>
Total Indirect Costs as % of Direct Cost		41%
<b>GRAND TOTAL</b>		<b>\$64,211</b>

**Administrative Cost Rates (%)**

	Cost Ranges for Indirect Cost Percentages				
	<=	<=	<=	>	
1. Engineering, Design and Construction (ED&C) Plan (7)	\$100,000	\$25,000,000		\$25,000,000	Small Plan
Variable Rate	8%	6%		4%	0%
2. Contingency (8)	\$500,000	\$5,000,000	\$50,000,000	\$50,000,000	Small Plan
Variable Rate	10%	8%	6%	4%	0%
3. Insurance (9)	1.5% of labor costs				
4. Bond (10)	3.0% of the O&M costs if O&M costs are >\$100,000				
5. Contractor Profit (11)	10% of the O&M costs				
6. Contract Administration (12)	\$1,000,000	\$25,000,000		\$25,000,000	
Variable Rate	10%	8%		6%	
7. BLM Indirect Costs	21% of contract administration				

**RECLAMATION COST ESTIMATION SUMMARY SHEET FOOTNOTES**

- Federal construction contracts require Davis-Bacon wage rates for contracts over \$2,000. Wage rate estimates may include base pay, payroll loading.
- The reclamation cost estimate must include the estimated plugging cost of at least one drill hole for each active drill rig in the project area. Where the
- Miscellaneous items should be itemized on accompanying worksheets.
- Fluid management should be calculated only when mineral processing activities are involved. Fluid management represents the costs of maintaining
- Handling of hazardous materials includes the cost of decontaminating, neutralizing, disposing, treating and/or isolating all hazardous materials used.
- Any mitigation measures required in the Plan of Operations must be included in the reclamation cost estimate. Mitigation may include measures to avoid,
- Engineering, design and construction (ED&C) plans are often necessary to provide details on the reclamation needed to contract for the required work. To
- A contingency cost is included in the reclamation cost estimation to cover unforeseen cost elements. Calculate the contingency cost as a percentage of the
- Insurance premiums are calculated at 1.5% of the total labor costs. Enter the premium amount if liability insurance is not included in the itemized unit
- Federal construction contracts exceeding \$100,000 require both a performance and a payment bond (Miller Act, 40 USC 270et seq.). Each bond premium
- For Federal construction contracts, use 10% of estimated O&M cost for the contractor's profit.
- To estimate the contract administration cost, use 6 to 10% of the operational and maintenance (O&M) cost. Calculate the contract administration cost as a
- BLM's indirect cost rate is 21% of BLM's contract administration costs.

**Closure Cost Estimate  
Reclamation Quantities**

Project Name: Hercules Project - Plan of Operations  
 Date of Submittal: 8-13-14  
 File Name: 2014 08 12 MiinquestCopy of SRCE\_Version\_1\_4\_1\_017\_NV\_2013\_costs sa.xlsm  
 Model Version: Version 1.4.1  
 Data Cost File: SRCE\_Cost\_Data\_File\_1\_12\_Std\_2013.xlsm  
 Cost Data: User Data  
 Cost Data File: SRCE\_Cost\_Data\_File\_1\_12\_Std\_2013.xlsm  
 Cost Estimate Type: Surety Cost Basis: Northern Nevada

Reclamation Quantity Summary												Unit Costs				
Description	Total Regrade or Haul Volume cy	Total Regrade or Haul Cost \$	Total Cover Volume cy	Cover Placement Cost \$	Total Growth Media Volume cy	Growth Media Placement Cost \$	Total Surface Area acres	Total Scarify Cost \$	Total Revetation Cost \$	TOTALS \$	Regrade Unit Cost \$/CY	Material Haul or Backfill Unit Cost \$/CY	Cover Unit Cost \$/CY	Growth Media Unit Cost \$/CY	Scarify Unit Cost \$/CY	Area Unit Cost \$/acre
1 Waste Rock Dumps		\$ -		\$ -		\$ -		\$ -	\$ -	\$ -		N/A				
2 Tailings Impoundments		\$ -		\$ -		\$ -		\$ -	\$ -	\$ -		N/A				
3 Heap Leach Pads		\$ -		\$ -		\$ -		\$ -	\$ -	\$ -		N/A				
5 Open Pits		\$ -		\$ -		\$ -		\$ -	\$ -	\$ -		N/A				
4 Quarries & Borrow Pits		\$ -		\$ -		\$ -		\$ -	\$ -	\$ -		N/A				
6 Roads		\$ -		\$ -		\$ -		\$ -	\$ -	\$ -		N/A				
7 Landfills		\$ -		\$ -		\$ -		\$ -	\$ -	\$ -		N/A				
8 Buildings		\$ -		\$ -		\$ -		\$ -	\$ -	\$ -		N/A				
9 Yards		\$ -		\$ -		\$ -	0.2	\$ 184	\$ 173	\$ 357		N/A			\$920.00	\$1,785.00
10 Ponds		\$ -		\$ -		\$ -		\$ -	\$ -	\$ -		N/A				
11 Exploration Roads	24,531	\$ 17,646				\$ -	17.77	\$ 3,018	\$ 8,290	\$ 28,954	\$0.72	N/A			\$169.84	\$1,629.38
12 Exploration Trenches	3,299	\$ 9,335				\$ -	0.8	\$ 390	\$ 9,725	\$ 9,725	\$2.83	N/A				\$12,156.25
13 Diversion Ditches		\$ -				\$ -		\$ -	\$ -	\$ -		N/A				
14 Sediment Ponds		\$ -				\$ -		\$ -	\$ -	\$ -		N/A				
15 Generic Haulage/Backfill		\$ -		\$ -		\$ -		\$ -	\$ -	\$ -		N/A				
16 Adit/Decline Backfilling1		\$ -		\$ -		\$ -		\$ -	\$ -	\$ -		N/A				
17 Shaft Backfilling		\$ -		\$ -		\$ -		\$ -	\$ -	\$ -		N/A				
<b>TOTALS</b>	<b>27,830</b>	<b>\$ 26,981</b>	<b>-</b>	<b>\$ -</b>	<b>-</b>	<b>\$ -</b>	<b>18.77</b>	<b>\$ 3,202</b>	<b>\$ 8,853</b>	<b>\$ 39,036</b>						
<b>Average Costs</b>	<b>per CY</b>	<b>\$0.97</b>	<b>per CY</b>		<b>per CY</b>		<b>per acre</b>	<b>\$170.59</b>	<b>\$2.76</b>	<b>\$2,080</b>	<b>per acre</b>					

**Closure Cost Estimate  
Expl. Roads & Pads**

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 Model Version: Version 1.4.1  
 Cost Data: User Data  
 Cost Data File: SRCE\_Cost\_Data\_File\_1\_12\_Std\_2013.xlsm  
 Cost Estimate Type: Surety      Cost Basis: Northern Nevada

Exploration Roads & Pads - Cost Summary				
	Labor	Equipment	Materials	Totals
Grading Costs	\$6,205	\$11,441	N/A	\$17,646
Cover Placement Cost	\$0	\$0	N/A	\$0
Ripping/Scarifying Cost	\$699	\$2,319	N/A	\$3,018
Subtotal Earthworks	<b>\$6,904</b>	<b>\$13,760</b>		<b>\$20,664</b>
Revegetation Cost	\$1,288	\$552	\$6,450	\$8,290
<b>TOTALS</b>	<b>\$8,192</b>	<b>\$14,312</b>	<b>\$6,450</b>	<b>\$28,954</b>

Exploration Roads & Pads - User Input																	
You must fill in ALL green cells and relevant blue cells in this section for each road																	
Facility Description			Physical (1) - MANDATORY										User Overrides		Growth Media		
ID	Description (required)	ID Code	Underlying Ground Slope % grade	Ungraded Slope _H:1V	Cut Slope degrees	Road + Drill Pad Length ft	Road Width ft	Number of Drill Pads	Individual Sump Volume cy	Drill Pad Width ft	Drill Pad Length ft	Slope Replacement Percent %	Regrade Volume (if calculated elsewhere) cy	Disturbed Area (if calculated elsewhere) acres	Growth Media Thickness in	Distance to Growth Media Stockpile ft	Slope from Road to Stockpile % grade
1	Proposed constructed roads and drill pads: 0-10%		5.0	1.3	45.0	804	12.0	8	5	24.0	60	100%					
2	Proposed constructed roads and drill pads: 11-20%		15.0	1.3	45.0	2,526	12.0	26	5	24.0	60	100%					
3	Proposed constructed roads and drill pads: 21-30%		25.0	1.3	45.0	6,049	12.0	45	5	24.0	60	100%					
4	Proposed constructed roads and drill pads: 31-40%		35.0	1.3	45.0	1,988	12.0	24	5	24.0	60	100%					
5	Proposed constructed roads and drill pads: 41-50%		45.0	1.3	45.0	13,167	12.0	64	5	24.0	60	100%					

- Notes:
1. All Physical parameters must be input even if manual overrides for volume or area are used.
  2. Slope replacement refers to the percentage of cut volume replaced during regrading.
  3. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivity Sheet)
  4. Sump volume will be applied to all roads on slopes <20%. On slopes >20% pad width (i.e. cut volume) should be adequate to account for sump volume.



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Expl. Roads & Pads**

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Exploration Roads & Pads - User Input (cont.)														
You must fill in ALL green cells and relevant blue cells in this section for each road														
	Description (required)	Grading				Growth Media				Revegetation				
		Regrade Material Condition (select)	Cut Material Type (select)	Recontouring Equipment Fleet (select)	Additional Hrs for Walk-in <sup>(1)</sup>	Growth Media Material Type (select)	Growth Media Placement Equipment Fleet (select)	Maximum Fleet Size (user override)	Additional Hrs for Walk-in <sup>(1)</sup>	Seed Mix (select)	Mulch (select)	Fertilizer (select)	Scarifying/ Ripping? (select)	Ripping Fleet (select)
1	Proposed constructed roads and drill pads: 0-10%	1.2	Basalt	Medium Excavat	0.5					Mix 3	None	None	Yes	Med Dozer
2	Proposed constructed roads and drill pads: 11-20%	1.2	Basalt	Medium Excavat	0.5					Mix 3	None	None	Yes	Med Dozer
3	Proposed constructed roads and drill pads: 21-30%	1.2	Basalt	Medium Excavat	0.5					Mix 3	None	None	Yes	Med Dozer
4	Proposed constructed roads and drill pads: 31-40%	1.2	Basalt	Medium Excavat	0.5					Mix 3	None	None	Yes	Med Dozer
5	Proposed constructed roads and drill pads: 41-50%	1.2	Basalt	Medium Excavat	0.5					Mix 3	None	None	Yes	Med Dozer

- Notes:
1. Include one-way hours necessary to walk equipment in from drop-off point to work area
  2. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table

Closure Cost Estimate  
Expl. Roads & Pads

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Exploration Roads & Pads - Calculations

Regrading Volume and Footprint Volume

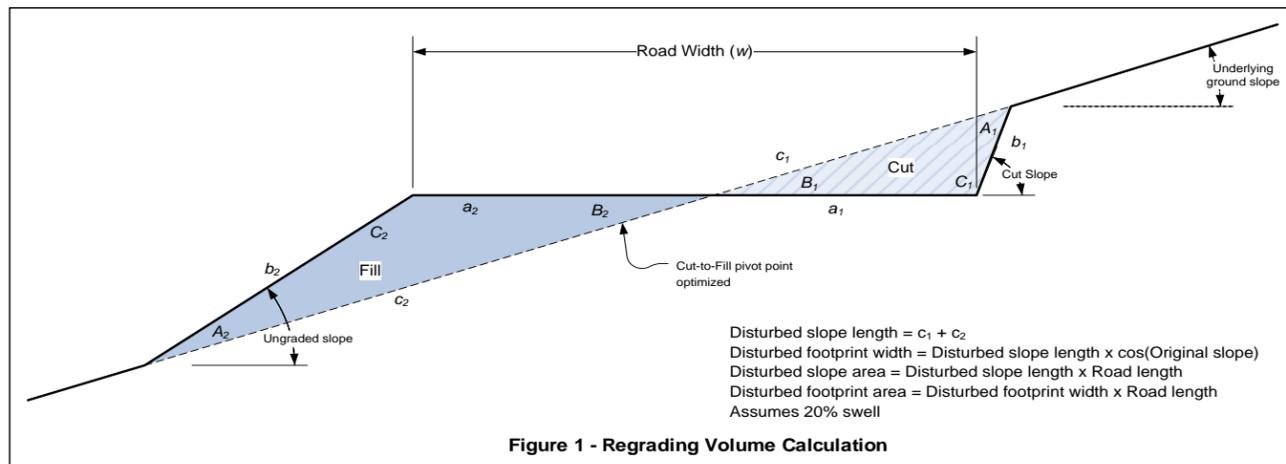


Figure 1 - Regrading Volume Calculation

Will not allow dozer for slopes greater than 30%  
 For dozer regrading push distance = road width  
 Assumes dozer push is uphill  
 Assumes minimum push distance of 100 ft

Swell Factor: 1.2

Ripping/Scarifying Calculations

Minimum 1 hr ripping/scarifying time per area  
 Number of passes = Final slope length ÷ Grader width  
 Travel distance = Number of passes x Road length  
 Total hours = (Travel distance ÷ Grader productivity) + (Number of passes x Grader maneuver time)  
 For dozer regrading assumes push distance = 3 x road width

Revegetation Calculations

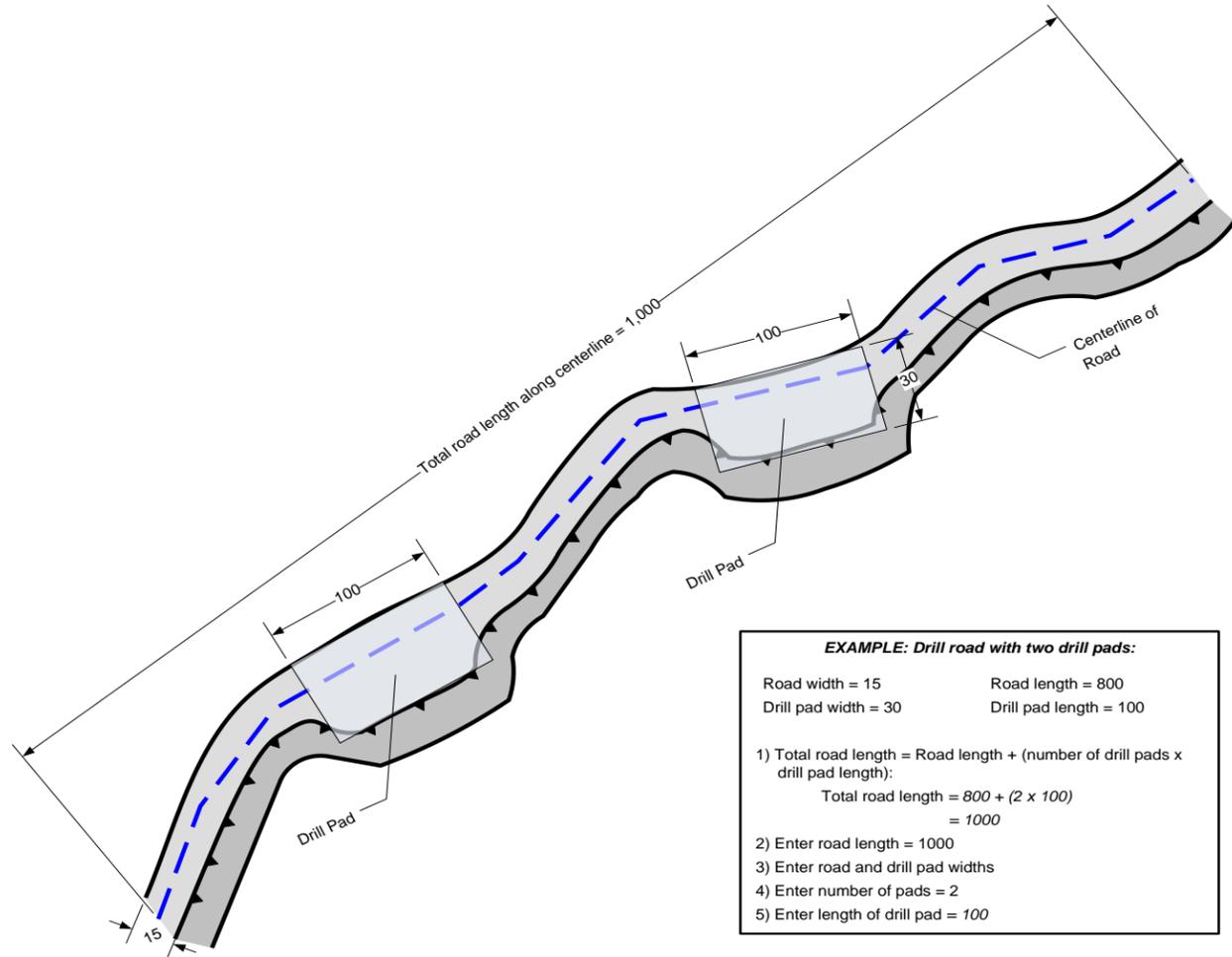
Minimum of 1 acre crew time per area

Closure Cost Estimate  
Expl. Roads & Pads

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Cover Placement Cost	\$0	\$0	N/A	\$0
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Subtotal Earthworks	<b>\$6,904</b>	<b>\$13,760</b>		<b>\$20,664</b>
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Inputting Exploration Roads and Drill Pads



**EXAMPLE: Drill road with two drill pads:**

Road width = 15                      Road length = 800  
 Drill pad width = 30                Drill pad length = 100

1) Total road length = Road length + (number of drill pads x drill pad length):  
     Total road length = 800 + (2 x 100)  
     = 1000

2) Enter road length = 1000  
 3) Enter road and drill pad widths  
 4) Enter number of pads = 2  
 5) Enter length of drill pad = 100

**Closure Cost Estimate  
Expl. Roads & Pads**

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Exploration Roads & Pads - Cost Summary				
	Labor	Equipment	Materials	Totals
Grading Costs	\$6,205	\$11,441	N/A	\$17,646
Cover Placement Cost	\$0	\$0	N/A	\$0
Ripping/Scarifying Cost	\$699	\$2,319	N/A	\$3,018
Subtotal Earthworks	<b>\$6,904</b>	<b>\$13,760</b>		<b>\$20,664</b>
Revegetation Cost	\$1,288	\$552	\$6,450	\$8,290
<b>TOTALS</b>	<b>\$8,192</b>	<b>\$14,312</b>	<b>\$6,450</b>	<b>\$28,954</b>

Exploration Roads & Pads - Regrading Costs										
	Description (required)	Total Road Length ft	Total Drill Pad Length ft	Regrading Volume cy	Recontouring Fleet	Equipment Productivity cy/hr	Total Equipment Hours <sup>(1)</sup> hr	Total Labor Cost \$	Total Equipment Cost \$	Total Regrading Cost \$
1	Proposed constructed roads and drill pads: 0-10%	324	480	130	325C	249	2	\$119	\$220	\$339
2	Proposed constructed roads and drill pads: 11-20%	966	1,560	1,091	325C	249	5	\$298	\$550	\$848
3	Proposed constructed roads and drill pads: 21-30%	3,349	2,700	3,629	325C	249	16	\$955	\$1,760	\$2,715
4	Proposed constructed roads and drill pads: 31-40%	548	1,440	2,709	325C	249	12	\$716	\$1,320	\$2,036
5	Proposed constructed roads and drill pads: 41-50%	9,327	3,840	16,972	325C	249	69	\$4,117	\$7,591	\$11,708
		14,514	10,020	24,531			104	<b>\$6,205</b>	<b>\$11,441</b>	<b>\$17,646</b>

(1) Includes walk-in time based on distance and travel speed (see Productivity sheet for speeds)

**Closure Cost Estimate  
Expl. Roads & Pads**

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Exploration Roads & Pads - Cost Summary				
	Labor	Equipment	Materials	Totals
Grading Costs	\$6,205	\$11,441	N/A	\$17,646
Cover Placement Cost	\$0	\$0	N/A	\$0
Ripping/Scarifying Cost	\$699	\$2,319	N/A	\$3,018
Subtotal Earthworks	<b>\$6,904</b>	<b>\$13,760</b>		<b>\$20,664</b>
Revegetation Cost	\$1,288	\$552	\$6,450	\$8,290
TOTALS	<b>\$8,192</b>	<b>\$14,312</b>	<b>\$6,450</b>	<b>\$28,954</b>

Exploration Roads & Pads - Growth Media Costs									
	Description (required)	Growth Media Volume cy	Growth Media Replacement Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost \$	Total Equipment Cost \$	Total Growth Media Cost \$
1	Proposed constructed roads and drill pads: 0-10%						\$0	\$0	\$0
2	Proposed constructed roads and drill pads: 11-20%						\$0	\$0	\$0
3	Proposed constructed roads and drill pads: 21-30%						\$0	\$0	\$0
4	Proposed constructed roads and drill pads: 31-40%						\$0	\$0	\$0
5	Proposed constructed roads and drill pads: 41-50%						\$0	\$0	\$0
							<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

**Closure Cost Estimate  
Expl. Roads & Pads**

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 Cost Estimate Type: Surety      Cost Basis: Northern Nevada

Exploration Roads & Pads - Cost Summary				
	Labor	Equipment	Materials	Totals
Grading Costs	\$6,205	\$11,441	N/A	\$17,646
Cover Placement Cost	\$0	\$0	N/A	\$0
Ripping/Scarifying Cost	\$699	\$2,319	N/A	\$3,018
Subtotal Earthworks	<b>\$6,904</b>	<b>\$13,760</b>		<b>\$20,664</b>
Revegetation Cost	\$1,288	\$552	\$6,450	\$8,290
<b>TOTALS</b>	<b>\$8,192</b>	<b>\$14,312</b>	<b>\$6,450</b>	<b>\$28,954</b>

Exploration Roads & Pads - Scarifying/Revegetation Costs											
	Description (required)	Surface Area acres	Ripping/ Scarifying Fleet	Ripping Hours hrs	Ripping Labor Costs \$	Ripping Equipment Cost \$	Total Ripping Costs \$	Revegetation Labor Cost \$	Revegetation Equipment Cost \$	Revegetation Material Cost \$	Total Revegetation Cost \$
1	Proposed constructed roads and drill pads: 0-10%	0.37	D9R	1	\$58	\$193	\$251	\$70	\$30	\$134	\$234
2	Proposed constructed roads and drill pads: 11-20%	1.38	D9R	1	\$58	\$193	\$251	\$97	\$41	\$501	\$639
3	Proposed constructed roads and drill pads: 21-30%	3.50	D9R	2	\$117	\$387	\$504	\$245	\$105	\$1,271	\$1,621
4	Proposed constructed roads and drill pads: 31-40%	1.69	D9R	1	\$58	\$193	\$251	\$118	\$51	\$613	\$782
5	Proposed constructed roads and drill pads: 41-50%	10.83	D9R	7	\$408	\$1,353	\$1,761	\$758	\$325	\$3,931	\$5,014
		17.77		12	<b>\$699</b>	<b>\$2,319</b>	<b>\$3,018</b>	<b>\$1,288</b>	<b>\$552</b>	<b>\$6,450</b>	<b>\$8,290</b>

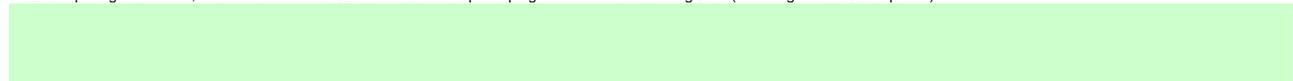
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Exploration**

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 Cost Estimate Type: Surety      Cost Basis: Northern Nevada

Exploration - Cost Summary				
	Labor	Equipment	Materials	Totals
Hole Abandonment Costs	\$778	\$804	\$20	\$1,602
Trench Backfilling Costs	\$58	\$91		\$149
Subtotal Earthworks	<b>\$836</b>	<b>\$895</b>	<b>\$20</b>	<b>\$1,751</b>
Trench Revegetation Costs	\$70	\$30	\$36	\$136
<b>TOTALS</b>	<b>\$906</b>	<b>\$925</b>	<b>\$56</b>	<b>\$1,887</b>

Exploration Drillhole Abandonment - User Input										
Facility Description			Hole Plugging							
	Description (required)	ID Code	Hole Type (select)	Diameter in	Total Number of Holes	Max Holes Open at One Time	Casing to Remove ft	Average Depth of Hole <sup>(1)</sup> ft bgs	Depth to Water ft bgs	Hole Plug Method (select)
1	rc rig		Reverse Circ	8.0	1.0	1.0	300.0	300.0	1,000.0	Grout + Backfill
2	core		Core	8.0	1.0	1.0	0.0	300.0	1,000.0	Grout + Backfill

- Notes:
1. If core holes are pre-drilled, use length of hole below pre-drilled length
  2. If Top Plug is selected, assumes maximum 1/2hr laborer time to place plug and backfill with cuttings/soil (including move-to/set up time).



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Trench Backfilling Costs	\$58	\$91		\$149
Subtotal Earthworks	<b>\$836</b>	<b>\$895</b>	<b>\$20</b>	<b>\$1,751</b>
Trench Revegetation Costs	\$70	\$30	\$36	\$136
<b>TOTALS</b>	<b>\$906</b>	<b>\$925</b>	<b>\$56</b>	<b>\$1,887</b>

Exploration Trenches - User Input													
Facility Description			Trench Parameters					Backfill			Revegetation		
ID	Description (required)	ID Code	Trench Length (ft)	Trench Depth (ft)	Trench Bottom Width (ft)	Trench Sideslope Angle (degrees)	Additional Hrs for Walk-in <sup>(1)</sup> (hr)	Backfill Material (select)	Cut Material Type (select)	Backfilling Fleet (select)	Seed Mix (select)	Mulch (select)	Fertilizer (select)
1	trench		95	5.0	6.0	90.0	0.5	1.2	Basalt	Small Dozer	Mix 3	None	None

- Notes:
1. Include one-way hours necessary to walk equipment in from drop-off point to work area
  2. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table



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<b>TOTALS</b>	<b>\$906</b>	<b>\$925</b>	<b>\$56</b>	<b>\$1,887</b>

Exploration Drillhole Abandonment														
	Description (required)	Vol/foot of depth ft3	Hole Plugging Material <sup>(1)</sup>	Total Grout Volume <sup>(2)</sup> cy	Total Cuttings Volume cy	Total Top Seal Volume <sup>(3,4)</sup> cy	Total Drillhole Abandon. Hours <sup>(6,7)</sup> hrs	Casing Removal Labor Cost <sup>(5)</sup> \$	Casing Removal Equipment Cost \$	Plugging Labor Cost \$	Plugging Equipment Cost \$	Plugging Material Cost \$	Top Seal Material Cost <sup>(2,3)</sup> \$	Total Cost <sup>(6,7)</sup> \$
1	rc rig	0.350	Cuttings	0.00	3.63	0.32	5	\$200	\$578	\$289	\$113	\$0	\$10	\$1,190
2	core	0.350	Cuttings	0.00	3.63	0.32	3	\$0	\$0	\$289	\$113	\$0	\$10	\$412
					7.26	0.64	8	\$200	\$578	\$578	\$226	\$0	\$20	\$1,602

Notes:

1. Assumes grout backfill from bottom of hole to 50' (15.24m) above static water level, up to 10' (3m) from top of hole
2. Assumes 25% loss to formation for grout backfill
3. If "Top Plug" hole plug method is used, assumes physical plug installed without backfill, grout or cement. Not available option for Nevada projects
4. Assumes top 20' (6 m) of hole is plugged with cement if "Grout Only", "Backfill + Grout", or "Cement Plug" hole plug method are chosen.
5. Assumes that a) casing is not cemented entire length, b) does not include temporary surface casing
6. Assumes minimum 1 hr per hole for abandonment (excluding move-to and casing removal)
7. Assumes fixed hours per hole for setup & tear-down and moving between holes (see Productivity Sheet) per drill hole (includes rig time if grouting required, labor crew only if cuttings backfill only)

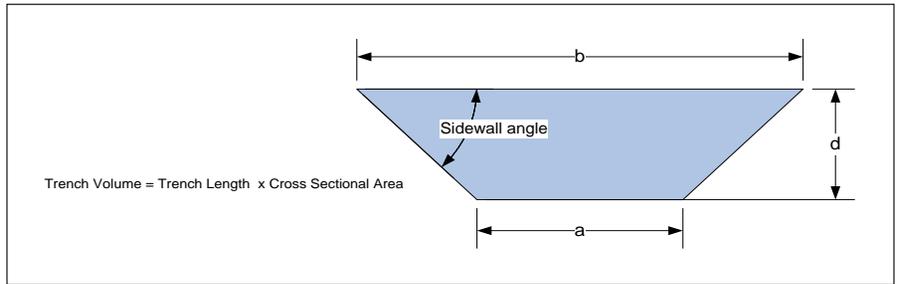
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<b>TOTALS</b>	<b>\$906</b>	<b>\$925</b>	<b>\$56</b>	<b>\$1,887</b>

**Exploration Trenches - Calculations**

**Exploration Trench Volume Calculation**



**Dozing & Ripping/Scarifying Calculations**

**Dozing:** Dozing distance = 1/2 trench length or 400 ft (max push) whichever is less  
 Assumes flat push (grade correction factor = 1)

**Revegetation:** 10 ft added to trench width to account for revegetation under spoil pile

**Closure Cost Estimate  
Exploration**

Project Name: Hercules Project - Plan of Operations  
 Date of Submittal: 8-13-14  
 File Name: 2014 08 12 MiinquestCopy of SRCE\_Version\_1\_4\_1\_017\_NV\_2013\_costs sa.xlsm  
 Model Version: Version 1.4.1  
 Cost Data: User Data  
 Cost Data File: SRCE\_Cost\_Data\_File\_1\_12\_Std\_2013.xlsm  
 Cost Estimate Type: Surety Cost Basis: Northern Nevada

Exploration - Cost Summary				
	Labor	Equipment	Materials	Totals
Hole Abandonment Costs	\$778	\$804	\$20	\$1,602
Trench Backfilling Costs	\$58	\$91		\$149
Subtotal Earthworks	<b>\$836</b>	<b>\$895</b>	<b>\$20</b>	<b>\$1,751</b>
Trench Revegetation Costs	\$70	\$30	\$36	\$136
<b>TOTALS</b>	<b>\$906</b>	<b>\$925</b>	<b>\$56</b>	<b>\$1,887</b>

Exploration Trenches - Backfill/Regrading Costs												
Productivity = Dozer Productivity x Grade Correction x Density Correction x Operator (0.75) x Material x Visibility x Job Efficiency (0.83)												
	Description (required)	Trench Backfill Volume  LCY (BCY+30%)	Dozer Push Distance  ft	Equipment Productivity  yd3/hr	Dozing Material  1.20	Density Correction  0.70	Backfilling Fleet  D6R	Corrected Hourly Productivity  yd3/hr	Total Dozer Hours  hr	Trench Backfill Labor Cost  \$	Trench Backfill Equipment Cost  \$	Total Trench Backfill Cost  \$
1	trench	138	50	1,121	1.20	0.70	D6R	586	1	\$58	\$91	\$149
		138							1	\$58	\$91	\$149

**Closure Cost Estimate  
Exploration**

Project Name: Hercules Project - Plan of Operations  
 Date of Submittal: 8-13-14  
 File Name: 2014 08 12 MiinquestCopy of SRCE\_Version\_1\_4\_1\_017\_NV\_2013\_costs sa.xlsm  
 Model Version: Version 1.4.1  
 Cost Data: User Data  
 Cost Data File: SRCE\_Cost\_Data\_File\_1\_12\_Std\_2013.xlsm  
 Cost Estimate Type: Surety      Cost Basis: Northern Nevada

<b>Exploration - Cost Summary</b>				
	<b>Labor</b>	<b>Equipment</b>	<b>Materials</b>	<b>Totals</b>
Hole Abandonment Costs	\$778	\$804	\$20	\$1,602
Trench Backfilling Costs	\$58	\$91		\$149
Subtotal Earthworks	<b>\$836</b>	<b>\$895</b>	<b>\$20</b>	<b>\$1,751</b>
Trench Revegetation Costs	\$70	\$30	\$36	\$136
<b>TOTALS</b>	<b>\$906</b>	<b>\$925</b>	<b>\$56</b>	<b>\$1,887</b>

<b>Exploration Trenches - Revegetation Costs</b>						
	<b>Description (required)</b>	<b>Surface Area acres</b>	<b>Revegetation Labor Cost \$</b>	<b>Revegetation Equipment Cost \$</b>	<b>Revegetation Material Cost \$</b>	<b>Total Revegetation Cost \$</b>
1	trench	0.10	\$70	\$30	\$36	\$136
		0.10	\$70	\$30	\$36	\$136

**Closure Cost Estimate  
Monitoring**

Project Name: Hercules Project - Plan of Operations  
 Date of Submittal: 8-13-14  
 File Name: 2014 08 12 MiinquestCopy of SRCE\_Version\_1\_4\_1\_017\_NV\_2013\_costs sa.xlsm  
 Model Version: Version 1.4.1  
 Cost Data: User Data  
 Cost Data File: SRCE\_Cost\_Data\_File\_1\_12\_Std\_2013.xlsm  
 Cost Estimate Type: Surety      Cost Basis: Northern Nevada

Reclamation Monitoring & Maintenance - Cost Summary				
	Labor	Equipment	Lab & Materials	Totals
Revegetation Maintenance	\$0	\$0	\$0	\$0
Erosion Maintenance	\$0	\$0	N/A	\$0
Reclamation Monitoring	\$3,300	\$345	N/A	\$3,645
Subtotal Reclamation Monitoring	<b>\$3,300</b>	<b>\$345</b>	<b>\$0</b>	<b>\$3,645</b>
Water Quality Monitoring	\$0	\$0	\$0	\$0
<b>TOTAL MONITORING</b>	<b>\$3,300</b>	<b>\$345</b>	<b>\$0</b>	<b>\$3,645</b>

Reclamation Maintenance								
Description	Total Revegetation Surface Area (1,2) acres	% Area Requiring Reseeding	Seed Mix (select)	Area Requiring Reseeding acres	Seed \$/acres	Labor \$/acres	Equipment \$/acres	Totals \$
<b>Revegetation Maintenance</b>	19			0.0	\$0.00	\$70.00	\$30.00	
Labor								\$0
Equipment								\$0
Materials								\$0
Cost/Acre								\$0
							<b>Subtotal</b>	<b>\$0</b>
Notes: 1) Surface area is NOT the same as footprint disturbance area typically used for permitting purposes.								
	Total Volume Growth Media cy	% Volume Requiring Maintenance	Average Growth Media Placement Cost \$/CY	Volume Requiring Replacement cy		Labor (assume: 25%) \$/acres	Equipment (assume: 75%) \$/acres	Total \$
<b>Erosion Maintenance</b>	0		\$0.00	0		\$0.00	\$0.00	\$0
Notes:								

Reclamation Monitoring					
Description	Hrs/Day	Days/Year	Number of Years	Rate \$/hr	
<b>Field Work</b>					
Field Geologist/Engineer				\$110.00	\$0
Range Scientist	6	1	3	\$110.00	\$1,980
<b>Reporting</b>					
Field Geologist/Engineer				\$110.00	\$0
Range Scientist	4	1	3	\$110.00	\$1,320
					<b>Subtotal \$3,300</b>
<b>Travel</b>					
	Hrs/Trip hr	Trips/Year	Years	Truck Cost \$/hr	
Travel	3	1	3	\$38.38	\$345
					<b>Subtotal \$345</b>
					<b>Total Reclamation Monitoring \$3,645</b>
Notes:					



2013 MOB/DEMOB using R.S. MEANS and SRCE equipment and DAVIS-BACON wages

blue font is for project specific user input

Miles one way from Washoe County Courthouse	45
Miles to project, one way	45
Hours travel time @ 55 MPH	0.82

Equipment	Mobilization \$/hour (1)	\$ Flat Rate load & unload (2)	\$/hour Deadhead (empty return cost) (3)	Disassembly and assembly (4)	Permit cost \$ (5)	Pilot car costs	# of units	One Way Mob Cost	Total Mob and Demob Cost
<b>Bulldozers</b>									
D6R	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
D7R	\$ 122	\$ 122	\$ -	\$ -	\$ 25	\$ -		\$ -	\$ -
D8R	\$ 171	\$ 171	\$ -	\$ -	\$ 25	\$ -	1	\$ 336	\$ 671
D9R	\$ 171	\$ 171	\$ -	\$ -	\$ 25	\$ -		\$ -	\$ -
D10R	\$ 171	\$ 171	\$ -	\$ 7,900	\$ 25	\$ -		\$ -	\$ -
D11R (two transports) (7)	\$ 171	\$ 171	\$ -	\$ 7,900	\$ 25	\$ -		\$ -	\$ -
<b>Motor Graders</b>									
14G/H	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
16G/H	\$ 122	\$ 122	\$ -	\$ -	\$ 25	\$ -		\$ -	\$ -
<b>Track Excavators</b>									
320C	\$ 122	\$ 122	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
325C	\$ 122	\$ 122	\$ -	\$ -	\$ -	\$ -	1	\$ 221	\$ 443
345B	\$ 171	\$ 171	\$ -	\$ -	\$ 25	\$ -		\$ -	\$ -
385BL	\$ 171	\$ 171	\$ -	\$ 20,200	\$ 25	\$ -		\$ -	\$ -
<b>Scrapers</b>									
631G	\$ 171	\$ 171	\$ -	\$ -	\$ 25	\$ -		\$ -	\$ -
637G PP	\$ 171	\$ 171	\$ -	\$ -	\$ 25	\$ -		\$ -	\$ -
<b>Wheeled Loaders</b>									
928G	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
966G	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
972G	\$ 122	\$ 122	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
988G	\$ 122	\$ 122	\$ -	\$ -	\$ 25	\$ -		\$ -	\$ -
992G (two transports) (7)	\$ 171	\$ 171	\$ -	\$ 32,300	\$ 25	\$ -		\$ -	\$ -
<b>Hydraulic Hammers</b>									
H-120 (fits 325) no charge, mobilize with m	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
H-160 (fits 345) no charge, mobilize with m	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
H-180 (fits 365/385) no charge, mobilize with m	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
<b>Other Equipment</b>									
420D 4WD Backhoe	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
CS563E Vibratory Roller	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Light Truck - 1.5 Ton	\$ 70	\$ 70	\$ -	\$ -	\$ -	\$ -	1	\$ 127	\$ 255
Supervisor's Truck	\$ 57	\$ 57	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Air Compressor + tools	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Welding Equipment	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Heavy Duty Drill Rig	\$ 404	\$ 404	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Pump (plugging) Drill Rig	\$ 404	\$ 404	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Concrete Pump	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Gas Engine Vibrator	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Generator 5KW	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
HDEP Welder (pipe or liner)	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
5 Ton Crane Truck	\$ 93	\$ 93	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
25 Ton Crane	\$ 150	\$ 150	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
<b>Trucks</b>									
725	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
740	\$ 122	\$ 122	\$ -	\$ -	\$ 25	\$ -		\$ -	\$ -
769D	\$ 122	\$ 122	\$ -	\$ -	\$ 25	\$ -		\$ -	\$ -
777D (two transports) (8)	\$ 171	\$ 171	\$ -	\$ 32,300	\$ 25	\$ -		\$ -	\$ -
613E (5,000 gal) Water Wagon	\$ 171	\$ 171	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
621E (8,000 gal) Water Wagon	\$ 171	\$ 171	\$ -	\$ -	\$ 25	\$ -		\$ -	\$ -
Dump Truck (10-12 yd <sup>3</sup> )	\$ 136	\$ 136	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
<b>Miscellaneous</b>									
Equipment for dry hole abandonment (420D 4	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Pilot car (Light Truck)	\$ 58	\$ 58	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Truck Tractor + Lowbed Trailer 75 ton	\$ 171	\$ 171	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Truck Tractor + Flatbed Trailer 40 ton	\$ 122	\$ 122	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
Light Truck + Flatbed Trailer 25 ton	\$ 85	\$ 85	\$ -	\$ -	\$ -	\$ -		\$ -	\$ -
							3	\$	1,369

Footnotes and explanations of assumptions

- (1) The sum of the cost of equipment from either the SRCE or RSM equipment tab plus Davis-Bacon labor tab
- (2) Assumes minimum of 30 minutes load and secure and 30 minutes unsecure and unload machine.
- (3) No "Deadhead" (empty) charge for Mob up to 50 miles. More than 50 miles the cost of deadhead same rate as loaded miles.
- (4) Only large equipment requires disassembly for transport. Includes cost of mechanic + mechanic's truck + crane operator + crane.
- (5) Nevada Dept of Transportation overdimensional permits are \$25 per trip or \$60 per year.
- (6) Sum of mobilization plus all ancillary costs for one way loaded and return empty.
- (7) Two transports are required but the second transport does not need pilot cars or permits or a heavy duty trailer.
- (8) Two transports required with both requiring full complement of pilot cars and permits.
- (9) Pilot Car costs based on SRCE light truck costs and Davis-Bacon wages
- (10) SRCE costs based on July 2013 vendor quotes.
- (11) RS Means costs based on R.S. Means Heavy Construction Cost Data, 2013
- (12) Davis\_Bacon wages based on June 14, 2013 determination.

# Appendix D

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## Spill Contingency Plan

*Attachment 1 – Material Data Safety Sheets*

*Attachment 2 – Construction Site Best Management Practices*

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## HERCULES EXPLORATION PROJECT LYON COUNTY, NEVADA

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### Spill Contingency Plan

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#### OBJECTIVES

The purpose of this Spill Contingency Plan (Plan) is as follows:

- To identify all pollutant sources that may exist within the MinQuest Hercules Exploration Project Area.
- To identify Best Management Practices (BMPs) to prevent or reduce the quantity of potential pollutants discharged to the ground or surface water in order to minimize environmental impacts during and after the exploration project.

#### AVAILABILITY

A copy of this Plan shall be attached to the MinQuest Project operating plan, along with the Material Safety Data Sheets (MSDS) (Attachment 1) of all products used on site for vehicle maintenance or the exploration program. Attachment 2 lists the identified BMPs for the Project.

#### PREVENTIVE MAINTENANCE

Good housekeeping practices will be followed on site during the exploration project:

- An effort will be made to store only enough products required to do the job.
- All materials stored onsite will be stored in a neat, orderly manner in their original containers, with appropriate signs clearly designating the area, and, if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacturer's label.
- Manufacturers' recommendations for proper use and disposal will be followed.
- The Project Manager will inspect the Project daily to insure proper use and disposal of materials both on and off site.

MinQuest and its contractors will have a vehicle preventive maintenance program to insure that all vehicles are operating under optimum conditions and all hoses and fittings are in good condition and leak free. It is the responsibility of the operator, mechanic, tool pusher, or other designee to execute the repairs or preventive maintenance and complete any reporting required. Assignment for repair when equipment is in a remote location may be issued verbally by the field superintendent or district manager.

## SOURCE IDENTIFICATION

### Pollutants

Potential sources of pollutants from drilling rigs, service vehicles, and other equipment includes oil, fuel, and lubricating grease. Additional sources of pollutants may include drilling fluids (mud and foam), borehole plugging materials, solvents, trash, and other debris. These pollutants are not expected to come into contact with on-site soils or surface waters; however, BMPs will be employed to prevent the potential release of contaminants.

### Construction and Operational Debris

To minimize impacts during precipitation events, trash bins shall be regularly inspected for leaks.

### Spill Contingency Plan (GM-6)<sup>1/</sup>

Materials and equipment necessary for spill cleanup will be kept in the material storage area on site. Equipment and materials will include but not be limited to brooms, dust pans, mops, rags, gloves, goggles, sorbent materials, sand, sawdust, and plastic and metal trash containers specifically for this purpose.

Well-maintained equipment will be used to perform the work, and when practicable, major equipment maintenance will be performed off site. In the event of oil, fuel, and lubricating grease leaks, clean-up will be conducted as soon as possible. If the leak is on pavement or a compacted surface, an oil absorbing product such as Absorb® will be applied. Once the clean-up product has absorbed the leak, it will be swept up into watertight drums or bins and disposed of according to federal, state, or local regulations. If the leak occurs on soil, the contaminated soil will be removed and disposed of according to federal, state, or local regulations. In the event of a major spill, the following actions should be taken, in addition to any federal, state, and local health and safety requirements:

- Contain the spread or migration of the spill, using on-hand supply of erosion control structures and/or by creating dirt berms, as feasible and necessary. Also utilize the materials and equipment stored on site to control the spill.
- Notify the environmental or project manager immediately.

Within 24 hours of an identified spill, the site manager or a designated representative will notify the following local and state agencies:

<b>Bureau of Land Management (Carson District)</b>	(775) 885-6000
<b>Nevada Division of Environmental Protection</b>	(775) 687-4670
<b>Emergency Response Hotline</b>	(888) 331-6337

<sup>1/</sup> Specific BMPs are located in Attachment 2.

In case of an emergency, relevant phone numbers are provided below:

<b>Emergency Calls:</b>	911 / (775) 635-2253 (Nevada Highway Patrol) (775) 463-6600 (Lyon County Sheriff)
<b>Fire:</b>	911 / (775) 246-6209 (Central Lyon County Fire Protection District) (775) 635-2855 (Wild Land Fires) (775) 882-9187 (Sierra Front Interagency Dispatch Center)
<b>Hospital:</b>	(775) 445-7210 (Carson Tahoe Dayton Medical Center)

This Plan will be adjusted to include measures to prevent this type of spill from reoccurring and how to clean up the spill if there is another occurrence. A description of the spill, what caused it, and the clean-up measures are required to be included.

#### **BEST MANAGEMENT PRACTICES**

- During construction, water will be used for dust control, mixing grout, and cleanup. Water used for dust control will be sprayed over the ground at a rate which will moisten the soil but not cause runoff.
- It is the responsibility of the contractor to define construction staging areas to minimize footprint impacts and to prevent impacts to water courses and other sensitive areas.
- MinQuest and the contractor will maintain water-tight trash bins or dumpsters on the Project site to minimize leakage to the ground surface. Contractors will be responsible for maintaining contained areas for concrete wash-out and properly disposing of concrete, if used during construction activities.
- The Project supervisor will at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances).
- The following BMPs will be utilized as appropriate, and copies of each BMP are included in Attachment 2:
  - Spill Prevention and Control (GM-6)
  - Vehicle and Equipment Maintenance and Fueling (GM-8)
  - Material Delivery, Handling, Storage and Use (GM-10)
  - Liquid Waste Management (GM-13)
  - Hazardous Waste Management (GM-17)

# **Attachment 1**

Material Data Safety Sheets

# Material Safety Data Sheet

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

### CHEVRON and TEXACO REGULAR UNLEADED GASOLINES

**Product Use:** Fuel

**Product Number(s):** CPS201000 [See Section 16 for Additional Product Numbers]

**Synonyms:** Calco Regular Unleaded Gasoline, Chevron Regular Unleaded Gasoline, Chevron UL/CQ Gasoline, Gasolines, Automotive, Texaco Unleaded Gasoline

**Company Identification**

Chevron Products Company  
Marketing, MSDS Coordinator  
6001 Bollinger Canyon Road  
San Ramon, CA 94583  
United States of America

**Transportation Emergency Response**

CHEMTREC: (800) 424-9300 or (703) 527-3887

**Health Emergency**

Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

**Product Information**

Technical Information: (510) 242-5357

SPECIAL NOTES: This MSDS applies to: all motor gasoline.

## SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Gasoline	86290-81-5	100 %vol/vol
Benzene	71-43-2	0.1 - 4.9 %vol/vol
Toluene (methylbenzene)	108-88-3	1 - 25 %vol/vol
Ethyl benzene	100-41-4	0.1 - 3 %vol/vol
Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	1330-20-7	1 - 15 %vol/vol
Butane	106-97-8	1 - 12 %vol/vol
Heptane	142-82-5	1 - 4 %vol/vol
Hexane	110-54-3	1 - 5 %vol/vol
Cyclohexane	110-82-7	1 - 3 %vol/vol
Methylcyclohexane	108-87-2	1 - 2 %vol/vol
Pentane, 2,2,4-trimethyl- (Isooctane)	540-84-1	1 - 13 %vol/vol
Naphthalene	91-20-3	0.1 - 2 %vol/vol
Ethanol	64-17-5	0 - 10 %vol/vol

Methyl tert-butyl ether (MTBE)	1634-04-4	0 - 15 %vol/vol
Tertiary amyl methyl ether (TAME)	994-05-8	0 - 17 %vol/vol
Ethyl tert-butyl ether (ETBE)	637-92-3	0 - 18 %vol/vol

Motor gasoline is considered a mixture by EPA under the Toxic Substances Control Act (TSCA). The refinery streams used to blend motor gasoline are all on the TSCA Chemical Substances Inventory. The appropriate CAS number for refinery blended motor gasoline is 86290-81-5. The product specifications of motor gasoline sold in your area will depend on applicable Federal and State regulations.

### SECTION 3 HAZARDS IDENTIFICATION

\*\*\*\*\*

#### EMERGENCY OVERVIEW

- EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE
- HARMFUL OR FATAL IF SWALLOWED - MAY CAUSE LUNG DAMAGE IF SWALLOWED
- VAPOR HARMFUL
- CAUSES EYE AND SKIN IRRITATION
- LONG-TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN LABORATORY ANIMALS
- KEEP OUT OF REACH OF CHILDREN

\*\*\*\*\*

#### IMMEDIATE HEALTH EFFECTS

##### Eye:

Contact with the eyes causes irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision.

**Skin:** Contact with the skin causes irritation. Skin contact may cause drying or defatting of the skin. Symptoms may include pain, itching, discoloration, swelling, and blistering. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.

**Ingestion:** Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death.

**Inhalation:** The vapor or fumes from this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing.

#### DELAYED OR OTHER HEALTH EFFECTS:

**Reproduction and Birth Defects:** This material is not expected to cause birth defects or other harm to the developing fetus based on animal data.

**Cancer:** Prolonged or repeated exposure to this material may cause cancer. Gasoline has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Whole gasoline exhaust has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains benzene, which has been classified as a carcinogen by the National Toxicology Program (NTP) and a Group 1 carcinogen (carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains ethylbenzene which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

See Section 11 for additional information. Risk depends on duration and level of exposure.

### SECTION 4 FIRST AID MEASURES

**Eye:** Flush eyes with water immediately while holding the eyelids open. Remove contact lenses, if worn, after

initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

**Skin:** Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

**Ingestion:** If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

**Inhalation:** Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

**Note to Physicians:** Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

## SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

### FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Flammable liquid.

**NFPA RATINGS:** Health: 1 Flammability: 3 Reactivity: 0

### FLAMMABLE PROPERTIES:

**Flashpoint:** (Tagliabue Closed Cup ASTM D56) < -45 °C (< -49 °F)

**Autoignition:** > 280 °C (> 536 °F)

**Flammability (Explosive) Limits (% by volume in air):** Lower: 1.4 Upper: 7.6 (Typical)

**EXTINGUISHING MEDIA:** Dry Chemical, CO<sub>2</sub>, AFFF Foam or alcohol resistant foam if >15% volume polar solvents (oxygenates).

### PROTECTION OF FIRE FIGHTERS:

**Fire Fighting Instructions:** Use water spray to cool fire-exposed containers and to protect personnel. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

**Combustion Products:** Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

**Protective Measures:** Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.

**Spill Management:** Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

**Reporting:** Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required. This material is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Petroleum Exclusion. Therefore, releases to the environment may not be reportable under CERCLA.

## SECTION 7 HANDLING AND STORAGE

**Precautionary Measures:** READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Do not store in open or unlabeled containers. Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any other such use. Never siphon gasoline by mouth.

Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Wash

thoroughly after handling. Keep out of the reach of children.

**Unusual Handling Hazards:** WARNING! Do not use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.

**General Handling Information:** Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

**Static Hazard:** Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'. Improper filling of portable gasoline containers creates danger of fire. Only dispense gasoline into approved and properly labeled gasoline containers. Always place portable containers on the ground. Be sure pump nozzle is in contact with the container while filling. Do not use a nozzle's lock-open device. Do not fill portable containers that are inside a vehicle or truck/trailer bed.

**General Storage Information:** DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces . USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

**Container Warnings:** Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

## SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

### GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

### ENGINEERING CONTROLS:

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

### PERSONAL PROTECTIVE EQUIPMENT

**Eye/Face Protection:** No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

**Skin Protection:** No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Nitrile Rubber, Polyurethane, Viton, Chlorinated Polyethylene (or Chlorosulfonated Polyethylene).

**Respiratory Protection:** Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors.

When used as a fuel, this material can produce carbon monoxide in the exhaust. Determine if airborne concentrations are below the occupational exposure limit for carbon monoxide. If not, wear an approved positive-pressure air-supplying respirator.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

### Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
-----------	--------	-----	------	---------	----------

Benzene	ACGIH	.5 ppm (weight)	2.5 ppm (weight)	--	Skin A1 Skin
Benzene	CVX	1 ppm (weight)	5 ppm (weight)	--	--
Benzene	OSHA SRS	1 ppm (weight)	5 ppm (weight)	--	--
Benzene	OSHA Z-2	10 ppm (weight)	--	25 ppm (weight)	--
Butane	ACGIH	1000 ppm (weight)	--	--	--
Cyclohexane	ACGIH	100 ppm (weight)	--	--	--
Cyclohexane	OSHA Z-1	1050 mg/m3	--	--	--
Ethanol	ACGIH	1000 ppm (weight)	--	--	A4
Ethanol	OSHA Z-1	1900 mg/m3	--	--	--
Ethyl benzene	ACGIH	100 ppm (weight)	125 ppm (weight)	--	A3
Ethyl benzene	OSHA Z-1	435 mg/m3	--	--	--
Ethyl tert-butyl ether (ETBE)	ACGIH	5 ppm (weight)	--	--	--
Gasoline	ACGIH	300 ppm (weight)	500 ppm (weight)	--	A3
Heptane	ACGIH	400 ppm (weight)	500 ppm (weight)	--	--
Heptane	OSHA Z-1	2000 mg/m3	--	--	--
Hexane	ACGIH	50 ppm (weight)	--	--	Skin
Hexane	OSHA Z-1	1800 mg/m3	--	--	--
Methyl tert-butyl ether (MTBE)	ACGIH	50 ppm (weight)	--	--	A3
Methyl tert-butyl ether (MTBE)	CVX	--	50 ppm	--	--
Methylcyclohexane	ACGIH	400 ppm (weight)	--	--	--
Methylcyclohexane	OSHA Z-1	2000 mg/m3	--	--	--
Naphthalene	ACGIH	10 ppm (weight)	15 ppm (weight)	--	Skin
Naphthalene	OSHA Z-1	50 mg/m3	--	--	--
Pentane, 2,2,4-trimethyl- (Isooctane)	ACGIH	300 ppm (weight)	--	--	--
Pentane, 2,2,4-trimethyl- (Isooctane)	OSHA Z-1	2350 mg/m3	--	--	--
Tertiary amyl methyl ether (TAME)	ACGIH	20 ppm (weight)	--	--	--
Tertiary amyl methyl ether (TAME)	CVX	--	50 ppm	--	--
Toluene (methylbenzene)	ACGIH	50 ppm (weight)	--	--	Skin A4
Toluene (methylbenzene)	OSHA Z-2	200 ppm (weight)	--	300 ppm (weight)	--
Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	ACGIH	100 ppm (weight)	150 ppm (weight)	--	A4
Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	OSHA Z-1	435 mg/m3	--	--	--

Refer to the OSHA Benzene Standard (29 CFR 1910.1028) and Table Z-2 for detailed training, exposure monitoring, respiratory protection and medical surveillance requirements before using this product.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

**Color:** Colorless to yellow

**Physical State:** Liquid

**Odor:** Petroleum odor

**pH:** Not Applicable  
**Vapor Pressure:** 5 psi - 15 psi (Typical) @ 37.8 °C (100 °F)  
**Vapor Density (Air = 1):** 3 - 4 (Typical)  
**Boiling Point:** 37.8°C (100°F) - 204.4°C (400°F) (Typical)  
**Solubility:** Insoluble in water; miscible with most organic solvents.  
**Freezing Point:** Not Applicable  
**Melting Point:** Not Applicable  
**Specific Gravity:** 0.7 g/ml - 0.8 g/ml @ 15.6°C (60.1°F) (Typical)  
**Viscosity:** <1 SUS @ 37.8°C (100°F)  
**Evaporation Rate:** No Data Available

## SECTION 10 STABILITY AND REACTIVITY

**Chemical Stability:** This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

**Incompatibility With Other Materials:** May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

**Hazardous Decomposition Products:** None known (None expected)

**Hazardous Polymerization:** Hazardous polymerization will not occur.

## SECTION 11 TOXICOLOGICAL INFORMATION

### IMMEDIATE HEALTH EFFECTS

**Eye Irritation:** The Draize eye irritation mean score in rabbits for a 24-hour exposure was: 0/110.

**Skin Irritation:** For a 4-hour exposure, the Primary Irritation Index (PII) in rabbits is: 4.8/8.0.

**Skin Sensitization:** This material did not cause skin sensitization reactions in a Buehler guinea pig test.

**Acute Dermal Toxicity:** LD50: >3.75g/kg (rabbit).

**Acute Oral Toxicity:** LD50: >5 ml/kg (rat)

**Acute Inhalation Toxicity:** 4 hour(s) LD50: >20000mg/m<sup>3</sup> (rat).

**Subchronic Effects:** Exposure of rats for 13 weeks (6 hr/day for 5 days/week) to the light ends of gasoline (up to 20,000 mg/m<sup>3</sup>) resulted in minimal responses of toxicity. There were no indications of neurotoxicity based morphological, functional and biochemical indices. There was also no evidence of immunotoxicity in the rats. However, when rats were exposed to gasoline vapor containing ethanol up to 20,000 mg/m<sup>3</sup> there was evidence of both humoral immune suppression and mild astrogliosis. **Reproduction and Birth Defects:** Exposure of rats to the light ends of gasoline at up to 20,000 mg/m<sup>3</sup> had generally no impact upon reproductive abilities and did not cause birth defects.

**Genetic Toxicity:** Gasoline was not mutagenic, with or without activation, in the Ames assay (Salmonella typhimurium), Saccharomyces cerevisiae, or mouse lymphoma assays. In addition, point mutations were not induced in human lymphocytes. Gasoline was not mutagenic when tested in the mouse dominant lethal assay. Administration of gasoline to rats did not cause chromosomal aberrations in their bone marrow cells. Inhalation exposure of rats to the light ends of gasoline caused increased sister chromatid exchange in their peripheral white blood cells but did not cause an increase in micronucleated red blood cells in their bone marrow.

### ADDITIONAL TOXICOLOGY INFORMATION:

Gasolines are highly volatile and can produce significant concentrations of vapor at ambient temperatures. Gasoline vapor is heavier than air and at high concentrations may accumulate in confined spaces to present both safety and health hazards. When vapor exposures are low, or short duration and infrequent, such as during refueling and tanker loading/unloading, neither total hydrocarbon nor components such as benzene are likely to result in any adverse health effects. In situations such as accidents or spills where exposure to gasoline vapor is potentially high, attention should be paid to potential toxic effects of specific components. Information about specific components in gasoline can be found in Sections 2, 8 and 15 of this MSDS. More detailed information on the health hazard of specific gasoline components can be obtained calling the Chevron Emergency Information Center (see Section 1 for phone numbers).

Pathological misuse of solvents and gasoline, involving repeated and prolonged exposure to high concentrations of vapor is a significant exposure on which there are many reports in the medical literature. As with other solvents, persistent abuse involving repeated and prolonged exposures to high concentrations of vapor has been reported to result in central nervous system damage and eventually, death. In a study in which ten human volunteers were exposed for 30 minutes to approximately 200, 500 or 1000 ppm concentrations of gasoline vapor, irritation of the eyes was the only significant effect observed, based on both subjective and objective assessments.

Lifetime inhalation of wholly vaporized unleaded gasoline at 2056 ppm has caused increased liver tumors in

female mice and kidney cancer in male rats. In their 1988 review of carcinogenic risk from gasoline, The International Agency for Research on Cancer (IARC) noted that, because published epidemiology studies did not include any exposure data, only occupations where gasoline exposure may have occurred were reviewed. These included gasoline service station attendants and automobile mechanics. IARC also noted that there was no opportunity to separate effects of combustion products from those of gasoline itself. Although IARC allocated gasoline a final overall classification of Group 2B, i.e. possibly carcinogenic to humans, this was based on limited evidence in experimental animals plus supporting evidence including the presence in gasoline of benzene. The actual evidence for carcinogenicity in humans was considered inadequate.

To explore the health effects of workers potentially exposed to gasoline vapors in the marketing and distribution sectors of the petroleum industry, the American Petroleum Institute sponsored a cohort mortality study (Publication 4555), a nested case-control study (Publication 4551), and an exposure assessment study (Publication 4552). Histories of exposure to gasoline were reconstructed for cohort of more than 18,000 employees from four companies for the time period between 1946 and 1985. The results of the cohort mortality study indicated that there was no increased mortality from either kidney cancer or leukemia among marketing and marine distribution employees who were exposed to gasoline in the petroleum industry, when compared to the general population. More importantly, based on internal comparisons, there was no association between mortality from kidney cancer or leukemia and various indices of gasoline exposure. In particular, neither duration of employment, duration of exposure, age at first exposure, year of first exposure, job category, cumulative exposure, frequency of peak exposure, nor average intensity of exposure had any effect on kidney cancer or leukemia mortality. The results of the nested case-control study confirmed the findings of the original cohort study. That is, exposure to gasoline at the levels experienced by this cohort of distribution workers is not a significant risk factor for leukemia (all cell types), acute myeloid leukemia, kidney cancer or multiple myeloma.

## SECTION 12 ECOLOGICAL INFORMATION

### ECOTOXICITY

96 hour(s) LC50: 2.7 mg/l (Oncorhynchus mykiss)

48 hour(s) LC50: 3.0 mg/l (Daphnia magna)

96 hour(s) LC50: 8.3 mg/l (Cyprinodon variegatus)

96 hour(s) LC50: 1.8 mg/l (Mysidopsis bahia)

Gasoline studies have been conducted in the laboratory under a variety of test conditions with a range of fish and invertebrate species. An even more extensive database is available on the aquatic toxicity of individual aromatic constituents. The majority of published studies do not identify the type of gasoline evaluated, or even provide distinguishing characteristics such as aromatic content or presence of lead alkyls. As a result, comparison of results among studies using open and closed vessels, different ages and species of test animals and different gasoline types, is difficult.

The bulk of the available literature on gasoline relates to the environmental impact of monoaromatic (BTEX) and diaromatic (naphthalene, methyl naphthalenes) constituents. In general, non-oxygenated gasoline exhibits some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components which are the most prominent in the water soluble fraction and cause aquatic toxicity, are also highly volatile and can be readily biodegraded by microorganisms.

### ENVIRONMENTAL FATE

This material is expected to be readily biodegradable. Following spillage, the more volatile components of gasoline will be rapidly lost, with concurrent dissolution of these and other constituents into the water. Factors such as local environmental conditions (temperature, wind, mixing or wave action, soil type, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, can contribute to the weathering of spilled gasoline.

The aqueous solubility of non-oxygenated unleaded gasoline, based on analysis of benzene, toluene, ethylbenzene+xylenes and naphthalene, is reported to be 112 mg/l. Solubility data on individual gasoline constituents also available.

## SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

#### SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

**DOT Shipping Description:** GASOLINE,3,UN1203,II

**IMO/IMDG Shipping Description:** UN1203,GASOLINE,3,II,FLASH POINT SEE SECTION 5

**ICAO/IATA Shipping Description:** UN1203, GASOLINE, 3, II

#### SECTION 15 REGULATORY INFORMATION

- EPCRA 311/312 CATEGORIES:** 1. Immediate (Acute) Health Effects: YES  
 2. Delayed (Chronic) Health Effects: YES  
 3. Fire Hazard: YES  
 4. Sudden Release of Pressure Hazard: NO  
 5. Reactivity Hazard: NO

**REGULATORY LISTS SEARCHED:**

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Benzene	01-1, 02, 03, 04, 05, 06, 07
Butane	05, 06, 07
Cyclohexane	03, 05, 06, 07
Ethanol	01-1, 02, 04, 05, 06, 07
Ethyl benzene	01-2B, 03, 04, 05, 06, 07
Gasoline	01-2B, 07
Heptane	05, 06, 07
Hexane	03, 05, 06, 07
Methyl tert-butyl ether (MTBE)	03, 05, 06, 07
Methylcyclohexane	05, 06, 07
Naphthalene	01-2B, 02, 03, 04, 05, 06, 07
Pentane, 2,2,4-trimethyl- (Isooctane)	05, 06, 07
Toluene (methylbenzene)	03, 04, 05, 06, 07
Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	03, 05, 06, 07

**CERCLA REPORTABLE QUANTITIES(RQ)/EPCRA 302 THRESHOLD PLANNING QUANTITIES(TPQ):**

Component	Component RQ	Component TPQ	Product RQ
Benzene	10 lbs	None	186 lbs
Butane	100 lbs	None	725 lbs

Cyclohexane	1000 lbs	None	34188 lbs
Ethanol	100 lbs	None	1934 lbs
Ethyl benzene	1000 lbs	None	34964 lbs
Gasoline	100 lbs	None	107 lbs
Heptane	100 lbs	None	3442 lbs
Hexane	5000 lbs	None	129149 lbs
Methyl tert-butyl ether (MTBE)	1000 lbs	None	7513 lbs
Methylcyclohexane	100 lbs	None	4278 lbs
Naphthalene	100 lbs	None	4000 lbs
Pentane, 2,2,4-trimethyl- (Isooctane)	1000 lbs	None	6270 lbs
Toluene (methylbenzene)	1000 lbs	None	3678 lbs
Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	100 lbs	None	649 lbs

**CHEMICAL INVENTORIES:**

All components comply with the following chemical inventory requirements: DSL (Canada), EINECS (European Union), KECI (Korea), TSCA (United States).

One or more components does not comply with the following chemical inventory requirements: AICS (Australia), ENCS (Japan), IECSC (China), PICCS (Philippines).

**WHMIS CLASSIFICATION:**

Class B, Division 2: Flammable Liquids

Class D, Division 2, Subdivision A: Very Toxic Material -  
Carcinogenicity

Class D, Division 2, Subdivision B: Toxic Material -  
Skin or Eye Irritation

**SECTION 16 OTHER INFORMATION**

**NFPA RATINGS:** Health: 1 Flammability: 3 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, \*- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

**Additional Product Number(s):** CPS201023, CPS201054, CPS201055, CPS201075, CPS201090, CPS201105, CPS201106, CPS201120, CPS201121, CPS201122, CPS201126, CPS201128, CPS201131, CPS201136, CPS201141, CPS201142, CPS201148, CPS201153, CPS201158, CPS201161, CPS201162, CPS201168, CPS201175, CPS201181, CPS201185, CPS201186, CPS201188, CPS201216, CPS201217, CPS201218, CPS201236, CPS201237, CPS201238, CPS201266, CPS201267, CPS201268, CPS201277, CPS201278, CPS201279, CPS201286, CPS201287, CPS201289, CPS201296, CPS201297, CPS201298, CPS201849, CPS201850, CPS201855, CPS201856, CPS201857, CPS204000, CPS204001, CPS204002, CPS204003, CPS204010, CPS204011, CPS204022, CPS204023, CPS204046, CPS204047, CPS204070, CPS204071, CPS204088, CPS204089, CPS204104, CPS204105, CPS204116, CPS204117, CPS204140, CPS204141, CPS204164, CPS204165, CPS204188, CPS204189, CPS204200, CPS204201, CPS204207, CPS204212, CPS204213, CPS204224, CPS204225, CPS204248, CPS204249, CPS204272, CPS204273, CPS204290, CPS204291, CPS204322, CPS204323, CPS204324, CPS204350, CPS204352, CPS204354, CPS204356, CPS204358, CPS204359, CPS204364, CPS204365, CPS204370, CPS204371, CPS204376, CPS204377, CPS204382, CPS204383, CPS204388, CPS204389, CPS204394, CPS204395, CPS204400, CPS204401, CPS204406, CPS204407, CPS204412, CPS204413, CPS204418, CPS204419, CPS204424, CPS204425, CPS204430, CPS204431, CPS204436, CPS204437, CPS204442, CPS204446, CPS204450, CPS204454, CPS204458, CPS204462, CPS204466, CPS204467, CPS204484, CPS204485, CPS204502, CPS204503, CPS204520, CPS204521, CPS204538, CPS204539, CPS204556, CPS204557, CPS204574, CPS204575, CPS204592, CPS204593, CPS204610, CPS204611, CPS204628, CPS204629, CPS204646, CPS204647, CPS204664, CPS204665, CPS204682, CPS204690, CPS204691, CPS204696, CPS204697,

CPS204702, CPS204703, CPS204708, CPS204709, CPS204721, CPS204722, CPS204727, CPS204728, CPS204739, CPS241765

**REVISION STATEMENT:** This revision updates the following sections of this Material Safety Data Sheet: 2, 16.

**Revision Date:** March 31, 2008

**ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:**

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

**The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.**

### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** No. 2 Diesel Fuel

**MSDS Code:** 001847

**Synonyms:** CARB Diesel TF3; CARB Diesel; CARB Diesel 10%  
CARB Diesel Ultra Low Sulfur - Dyed and Undyed  
EPA Low Sulfur Diesel Fuel - Dyed and Undyed  
EPA Off Road High Sulfur Diesel - Dyed  
High Sulfur Diesel Fuel; Low Sulfur Diesel Fuel  
No. 2 Diesel Fuel Oil  
No. 2 High Sulfur Diesel - Dyed  
No. 2 Low Sulfur Diesel - Dyed; No. 2 Low Sulfur Diesel - Undyed  
No. 2 Low Sulfur Distillate  
No. 2 Ultra Low Sulfur Diesel - Dyed; No. 2 Ultra Low Sulfur Diesel - Undyed  
Super Diesel Fuel; Super Diesel Fuel II-LS  
Virgin Diesel Fuel; No. 2 Distillate  
ULSD  
Super Diesel Fuel; Super Diesel Fuel II-LS  
Virgin Diesel Fuel

**Intended Use:** Fuel

**Responsible Party:** ConocoPhillips  
600 N. Dairy Ashford  
Houston, Texas 77079-1175

**MSDS Information:** Phone: 800-762-0942  
Email: [MSDS@conocophillips.com](mailto:MSDS@conocophillips.com)  
Internet: <http://w3.conocophillips.com/NetMSDS/>

**Emergency Telephone Numbers:** Chemtrec: 800-424-9300 (24 Hours)  
California Poison Control System: 800-356-3219

### 2. HAZARDS IDENTIFICATION

#### Emergency Overview

**WARNING!**  
Flammable Liquid and Vapor  
Skin Irritant  
Aspiration Hazard

#### NFPA



**Appearance:** Straw colored to dyed red  
**Physical Form:** Liquid  
**Odor:** Diesel fuel

#### Potential Health Effects

**Eye:** Contact may cause mild eye irritation including stinging, watering, and redness.

**Skin:** Mild to moderate skin irritant. Contact may cause redness, itching, a burning sensation, and skin damage. Prolonged or repeated contact may cause drying and cracking of the skin, dermatitis (inflammation), burns, and severe skin damage. No harmful effects from skin absorption have been reported.

**Inhalation (Breathing):** No information available on acute toxicity. See signs and symptoms.

**Ingestion (Swallowing):** Low degree of toxicity by ingestion. ASPIRATION HAZARD - This material can enter lungs during swallowing or vomiting and cause lung inflammation and damage.

**Signs and Symptoms:** Effects of overexposure may include irritation of the respiratory tract, irritation of the digestive tract, nausea, diarrhea, signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

**Pre-Existing Medical Conditions:** Conditions aggravated by exposure may include skin disorders.

See Section 11 for additional Toxicity Information.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Diesel Fuel No. 2	68476-34-6	100
Naphthalene	91-20-3	<1

### 4. FIRST AID MEASURES

**Eye:** If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

**Skin:** Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention.

**Inhalation (Breathing):** Immediately move victim away from exposure and into fresh air. If respiratory symptoms or other symptoms of exposure develop, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

**Ingestion (Swallowing):** Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

### 5. FIRE-FIGHTING MEASURES

#### NFPA 704 Hazard Class

**Health:** 1    **Flammability:** 2    **Instability:** 0            (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

**Unusual Fire & Explosion Hazards:** This material is flammable and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. If container is not properly cooled, it can rupture in the heat of a fire.

**Extinguishing Media:** Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

**Fire Fighting Instructions:** For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by DOT, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk.

Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical equipment is recommended.

**Spill precautions:** Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8).

**Environmental precautions:** Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Dike far ahead of spill for later recovery or disposal. Use foam on spills to minimize vapors (see Section 5). Spilled material may be absorbed into an appropriate absorbent material.

**Methods for cleaning up:** Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, notify the National Response Center (phone number 800-424-8802).

## 7. HANDLING AND STORAGE

**Handling:** Open container slowly to relieve any pressure. Bond and ground all equipment when transferring from one vessel to another. Can accumulate static charge by flow or agitation. Can be ignited by static discharge. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-704 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Section 8).

Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames. Use good personal hygiene practices.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum conditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

**Storage:** Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Post area "No Smoking or Open Flame." Store only in approved containers.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	ACGIH	OSHA	Other:
Diesel Fuel No. 2	TWA: 100 mg/m <sup>3</sup> Skin	---	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

**Engineering controls:** If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits additional engineering controls may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

### Personal Protective Equipment (PPE):

**Eye/Face:** Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary.

**Skin:** The use of nitrile gloves impervious to the specific material handled is advised to prevent skin contact, possible irritation, and skin damage (see glove manufacturer literature for information on permeability). Depending on conditions of use, nitrile apron and/or arm covers may be necessary.

**Respiratory:** A NIOSH certified air purifying respirator with an organic vapor cartridge may be used under conditions where airborne concentrations are expected to exceed exposure limits.

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is potential for an oxygen-deficient atmosphere, uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

**Other Protective Equipment:** Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse. It is recommended that impervious clothing be worn when skin contact is possible.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Note:** Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

<b>Appearance:</b>	Straw colored to dyed red
<b>Physical Form:</b>	Liquid
<b>Odor:</b>	Diesel fuel
<b>Odor Threshold:</b>	No data
<b>pH:</b>	Not applicable
<b>Vapor Pressure:</b>	0.40 mm Hg
<b>Vapor Density (air=1):</b>	> 3
<b>Boiling Point/Range:</b>	300-690°F / 149-366°C
<b>Melting/Freezing Point:</b>	No data
<b>Solubility in Water:</b>	Negligible
<b>Partition Coefficient (n-octanol/water) (Kow):</b>	No data
<b>Specific Gravity:</b>	0.81-0.88 @ 60°F (15.6°C)
<b>Bulk Density:</b>	7.08 lbs/gal
<b>Percent Volatile:</b>	Negligible @ ambient conditions
<b>Evaporation Rate (nBuAc=1):</b>	<1
<b>Flash Point:</b>	125-180°F / 52-82°C
<b>Test Method:</b>	Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
<b>LEL (vol % in air):</b>	0.3
<b>UEL (vol % in air):</b>	10.0
<b>Autoignition Temperature:</b>	500°F / 260°C

## 10. STABILITY AND REACTIVITY

**Stability:** Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Flammable liquid and vapor. Vapor can cause flash fire.

**Conditions to Avoid:** Avoid all possible sources of ignition (see Sections 5 and 7).

**Materials to Avoid (Incompatible Materials):** strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc..

**Hazardous Decomposition Products:** Combustion can yield carbon, nitrogen and sulfur oxides. The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of combustion products (e.g., oxides of carbon, sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels. Diesel engine exhaust contains hazardous combustion products and has been classified as a probable cancer hazard in humans.

**Hazardous Polymerization:** Will not occur.

## 11. TOXICOLOGICAL INFORMATION

**Chronic Data:**

## Diesel Fuel No. 2

**Carcinogenicity:** Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation. Animal studies have also shown that washing the skin with soap and water can reduce the tumor response. Middle distillates with low polynuclear aromatic hydrocarbon content have not been identified as a carcinogen by NTP, IARC or OSHA. Diesel exhaust has been identified as a probable cancer hazard by IARC

**Target Organs:** Limited evidence of renal impairment has been noted from a few older case reports involving excessive exposure to diesel fuel No. 2. However, renal toxicity has not been demonstrated to be a consistent finding of diesel fuel exposure.

## Naphthalene

**Carcinogenicity:** Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

## Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Diesel Fuel No. 2	9 ml/kg (Rat)	>5ml/kg (Rabbit)	No data available

## 12. ECOLOGICAL INFORMATION

When middle distillate hydrocarbons escape into the environment due to leaks or spills, most of their constituent hydrocarbons will evaporate and be photodegraded by reaction with hydroxyl radicals in the atmosphere. The half-lives in air for many of the individual hydrocarbons is less than one day. Less volatile hydrocarbons can persist in the aqueous environment for longer periods. They remain floating on the surface of the water; those that reach soil or sediment biodegrade relatively slowly. Soil contaminated with middle distillates can develop adapted microbial species able to use the fuel as a carbon source; soil aeration and nutrient supplementation can enhance this biodegradation.

Reported LC50/EC50 values for water-soluble fractions of middle distillates are usually in the range of 10 to 100 mg/liter. Adverse effects on the gills, pseudobranch, kidney and nasal mucosa have been reported in fish involved in spills of middle distillates. Juvenile clams may be particularly sensitive to marine sediments contaminated as a result of spilled material. Direct toxicity and fouling of sea birds can occur if birds dive through floating layers of spilled material.

Phytotoxic effects of middle distillate hydrocarbons have been reported following exposure of plants to sprays or vapors. Lack of seed germination and inhibition of seedling growth may also occur. There is evidence for moderate bioaccumulation of the water-soluble hydrocarbons present in middle distillates.

## 13. DISPOSAL CONSIDERATIONS

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

### EPA Waste Number(s)

- D001 - Ignitability characteristic

## 14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

**14. TRANSPORTATION INFORMATION**

**Shipping Description:** Diesel fuel, Combustible liquid, NA1993, III  
**Non-Bulk Package Marking:** Not Regulated [49 CFR 173.150(f)(2)]  
**Non-Bulk Package Labeling:** Not Regulated [49 CFR 173.150(f)(2)]  
**Bulk Package/Placard Marking:** Combustible/1993  
**Packaging - References:** None; none; 49 CFR 173.241  
*(Exceptions; Non-bulk; Bulk)*  
**Emergency Response Guide:** 128  
**Note:** *May also be shipped as:* Diesel fuel, Combustible liquid, UN1202, III  
*Bulk Package/Placard Marking would also be changed to:* 1202

**International Maritime Dangerous Goods (IMDG)**

**Shipping Description:** *Not regulated if flashpoint is >60° C closed-cup*  
 UN1202, Diesel fuel, 3, III, (FP° C), where FP is the material's flash point in degrees C.  
**Non-Bulk Package Marking:** Diesel fuel, UN1202  
**Labels:** Flammable liquid  
**Placards/Marking (Bulk):** Flammable/1202  
**Packaging - Non-Bulk:** P001, LP01  
**EMS:** F-E, S-E  
**Note:** *May also replace Diesel fuel with Gas Oil or Heating Oil, light as the Shipping Name*

**International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)**

**UN/ID #:** *Not regulated if flashpoint is >60° C cc*  
 UN1202  
**Proper Shipping Name:** Diesel fuel  
**Hazard Class/Division:** 3  
**Packing Group:** III  
**Non-Bulk Package Marking:** Diesel fuel, UN1202  
**Labels:** Flammable liquid  
**ERG Code:** 3L

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
<b>Packaging Instruction #:</b>	Y309	309	310
<b>Max. Net Qty. Per Package:</b>	10 L	60 L	220 L

**15. REGULATORY INFORMATION**

**CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):**

This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

**CERCLA/SARA - Section 311/312 (Title III Hazard Categories)**

**Acute Health:** Yes  
**Chronic Health:** Yes  
**Fire Hazard:** Yes  
**Pressure Hazard:** No  
**Reactive Hazard:** No

**CERCLA/SARA - Section 313 and 40 CFR 372:**

This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration (wt %)	de minimis
Naphthalene	<1	0.1%

**EPA (CERCLA) Reportable Quantity (in pounds):**

EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

**California Proposition 65:**

Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Type of Toxicity
Toluene	Developmental Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant
Naphthalene	Cancer

Diesel engine exhaust, while not a component of this material, is on the Proposition 65 list of chemicals known to the State of California to cause cancer.

**Canadian Regulations:**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class

B3 - Combustible Liquids

D2A - Very Toxic Material

D2B - Toxic Material

**National Chemical Inventories:**

Component	AICS	DSL	NDSL	CHINA	ELINCS	EINECS	ENCS	KOREA	PICCS	TSCA
Diesel Fuel No. 2 68476-34-6	X	X		X		X		X	X	X

U.S. Export Control Classification Number: EAR99

**16. OTHER INFORMATION**

**Issue Date:** 12-Mar-2007  
**Status:** Final  
**Product Code:** Multiple  
**Revised Sections or Basis for Revision:** Fire Fighting information (Section 5)  
**MSDS Code:** 001847

**MSDS Legend:**

ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

**Disclaimer of Expressed and implied Warranties:**

The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.



# Material Safety Data Sheet

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

### Chevron Ultra-Duty Grease EP

**Product Use:** Grease

**Product Number(s):** CPS238011, CPS238012, CPS238013

**Synonyms:** Chevron Ultra-Duty Grease EP NLGI 0, Chevron Ultra-Duty Grease EP NLGI 1, Chevron Ultra-Duty Grease EP NLGI 2

#### Company Identification

Chevron Products Company

a division of Chevron U.S.A. Inc.

6001 Bollinger Canyon Rd.

San Ramon, CA 94583

United States of America

www.chevronlubricants.com

#### Transportation Emergency Response

CHEMTREC: (800) 424-9300 or (703) 527-3887

#### Health Emergency

Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

#### Product Information

email : lubemsds@chevron.com

Product Information: (800) LUBE TEK

MSDS Requests: (800) 414-6737

## SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Highly refined mineral oil (C15 - C50)	Mixture	60 - 100 %wt/wt
Zinc dialkyldithiophosphate	68649-42-3	1 - 5 %wt/wt

**SECTION 3 HAZARDS IDENTIFICATION****IMMEDIATE HEALTH EFFECTS**

**Eye:** Not expected to cause prolonged or significant eye irritation.

**Skin:** Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.

**Ingestion:** Not expected to be harmful if swallowed.

**Inhalation:** Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

**SECTION 4 FIRST AID MEASURES**

**Eye:** No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.

**Skin:** No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, apply a waterless hand cleaner, mineral oil, or petroleum jelly. Then wash with soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

**Ingestion:** No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.

**Inhalation:** No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

**Note to Physicians:** In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

**SECTION 5 FIRE FIGHTING MEASURES****FIRE CLASSIFICATION:**

OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

**NFPA RATINGS:** Health: 0 Flammability: 1 Reactivity: 0

**FLAMMABLE PROPERTIES:**

**Flashpoint:** 274 °C (525 °F) Minimum

**Autoignition:** No Data Available

**Flammability (Explosive) Limits (% by volume in air):** Lower: Not Applicable Upper: Not Applicable

**EXTINGUISHING MEDIA:** Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

#### **PROTECTION OF FIRE FIGHTERS:**

**Fire Fighting Instructions:** This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

**Combustion Products:** Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

### **SECTION 6 ACCIDENTAL RELEASE MEASURES**

**Protective Measures:** Eliminate all sources of ignition in vicinity of spilled material.

**Spill Management:** Clean up spills immediately, observing precautions in Exposure Controls/Personal Protection section. Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

**Reporting:** Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at: (800) 424-8802 as appropriate or required.

### **SECTION 7 HANDLING AND STORAGE**

**Precautionary Measures:** Keep out of the reach of children.

**General Handling Information:** Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

**Static Hazard:** Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

**Container Warnings:** Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

### **SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION**

#### **GENERAL CONSIDERATIONS:**

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

#### ENGINEERING CONTROLS:

Use in a well-ventilated area.

#### PERSONAL PROTECTIVE EQUIPMENT

**Eye/Face Protection:** No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

**Skin Protection:** No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Neoprene, Nitrile Rubber, Silver Shield, Viton.

**Respiratory Protection:** No respiratory protection is normally required.

If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

#### Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	ACGIH	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	--	--
Highly refined mineral oil (C15 - C50)	OSHA Z-1	5 mg/m <sup>3</sup>	--	--	--

#### SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

**Color:** Red

**Physical State:** Semi-solid

**Odor:** Petroleum odor

**pH:** Not Applicable

**Vapor Pressure:** <0.01 mmHg Maximum @ 100 °C (212 °F)

**Vapor Density (Air = 1):** >1 Minimum

**Boiling Point:** >260°C (500°F) Minimum

**Solubility:** Soluble in hydrocarbons; insoluble in water

**Melting Point:** 165°C (329°F) (Min)

**Density:** No Data Available

**Viscosity:** No data available

**Evaporation Rate:** No Data Available

## SECTION 10 STABILITY AND REACTIVITY

**Chemical Stability:** This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

**Incompatibility With Other Materials:** May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

**Hazardous Decomposition Products:** None known (None expected)

**Hazardous Polymerization:** Hazardous polymerization will not occur.

## SECTION 11 TOXICOLOGICAL INFORMATION

### IMMEDIATE HEALTH EFFECTS

**Eye Irritation:** The Draize eye irritation mean score in rabbits for a 24-hour exposure was: 6.7/110.

**Skin Irritation:** For a 24-hour exposure, the Primary Irritation Score (PIS) in rabbits is: 0.6/8.0.

**Skin Sensitization:** No product toxicology data available.

**Acute Dermal Toxicity:** LD50: >2g/kg (rat).

**Acute Oral Toxicity:** The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.

**Acute Inhalation Toxicity:** The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

### ADDITIONAL TOXICOLOGY INFORMATION:

This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as: carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

## SECTION 12 ECOLOGICAL INFORMATION

### ECOTOXICITY

The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.

### ENVIRONMENTAL FATE

**Ready Biodegradability:** This material is not expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.

### SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

### SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

**DOT Shipping Description:** PETROLEUM LUBRICATING GREASE; NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR

**Additional Information:** NOT HAZARDOUS BY U.S. DOT. ADR/RID HAZARD CLASS NOT APPLICABLE.

**IMO/IMDG Shipping Description:** PETROLEUM LUBRICATING GREASE; MAY BE REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

**ICAO/IATA Shipping Description:** PETROLEUM LUBRICATING GREASE; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO

### SECTION 15 REGULATORY INFORMATION

**EPCRA 311/312 CATEGORIES:** 1. Immediate (Acute) Health Effects: NO

2. Delayed (Chronic) Health Effects: NO

3. Fire Hazard: NO

4. Sudden Release of Pressure Hazard: NO

5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1  
01-2A=IARC Group 2A  
01-2B=IARC Group 2B  
02=NTP Carcinogen

03=EPCRA 313  
04=CA Proposition 65  
05=MA RTK  
06=NJ RTK  
07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Zinc dialkyldithiophosphate

03, 06

#### CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), ENCS (Japan), IECSC (China), PICCS (Philippines), TSCA (United States).

One or more components does not comply with the following chemical inventory requirements: KECl (Korea).

#### NEW JERSEY RTK CLASSIFICATION:

Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Grease)

#### WHMIS CLASSIFICATION:

This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

#### SECTION 16 OTHER INFORMATION

**NFPA RATINGS:** Health: 0 Flammability: 1 Reactivity: 0

**HMIS RATINGS:** Health: 1 Flammability: 1 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, \*- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

#### LABEL RECOMMENDATION:

Label Category : GREASE 1 - GRS1

**REVISION STATEMENT:** This revision updates the following sections of this Material Safety Data Sheet: 2, 16

**Revision Date:** February 26, 2009

#### ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number

ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

**The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.**



# Gear Oil (68-460)

## Material Safety Data Sheet

### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Gear Oil (68-460)  
**MSDS Code:** 787305  
**Synonyms:** Conoco Gear Oil 68  
Conoco Gear Oil 100  
Conoco Gear Oil 150  
Conoco Gear Oil 220  
Conoco Gear Oil 320  
Conoco Gear Oil 460  
**Intended Use:** Gear Lubricant  
**Responsible Party:** ConocoPhillips Lubricants  
600 N. Dairy Ashford  
Houston, Texas 77079-1175  
**Customer Service:** 888-766-7676  
**Technical Information:** 800-255-9556  
**MSDS Information:** Internet: <http://w3.conocophillips.com/NetMSDS/>  
**Emergency Telephone Numbers:** Chemtrec: 800-424-9300 (24 Hours)  
California Poison Control System: 800-356-3219

### 2. HAZARDS IDENTIFICATION

#### Emergency Overview

This material is not considered hazardous according to OSHA criteria.

#### NFPA



**Appearance:** Clear and bright  
**Physical Form:** Liquid  
**Odor:** Characteristic petroleum

#### Potential Health Effects

**Eye:** Contact may cause mild eye irritation including stinging, watering, and redness.

**Skin:** Contact may cause mild skin irritation including redness and a burning sensation. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). A component of this material may cause an allergic skin reaction. No harmful effects from skin absorption are expected.

**Inhalation (Breathing):** Expected to have a low degree of toxicity by inhalation.

**Ingestion (Swallowing):** No harmful effects expected from ingestion.

**Signs and Symptoms:** Effects of overexposure may include irritation of the digestive tract, nausea and diarrhea. Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

**Pre-Existing Medical Conditions:** Conditions aggravated by exposure may include skin disorders.

See Section 11 for additional Toxicity Information.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Lubricant Base Oil (Petroleum)	VARIOUS	98 - 98.5
Additives	PROPRIETARY	1.5 - 2

### 4. FIRST AID MEASURES

**Eye:** If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

**Skin:** Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops and persists, seek medical attention.

**Inhalation (Breathing):** First aid is not normally required. If breathing difficulties develop, move victim away from source of exposure and into fresh air. Seek immediate medical attention.

**Ingestion (Swallowing):** First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

**Notes to Physician:** Acute aspirations of large amounts of oil-laden material may produce a serious aspiration pneumonia. Patients who aspirate these oils should be followed for the development of long-term sequelae. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities.

### 5. FIRE-FIGHTING MEASURES

#### NFPA 704 Hazard Class

**Health:** 0    **Flammability:** 1    **Instability:** 0            (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

**Unusual Fire & Explosion Hazards:** This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of a fire. Vapors are heavier than air and can accumulate in low areas.

**Extinguishing Media:** Dry chemical, carbon dioxide, foam, or water spray is recommended. Water or foam may cause frothing of materials heated above 212°F. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

**Fire Fighting Instructions:** For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by DOT, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk.

Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

### 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:** This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release.

**Spill precautions:** Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8).

**Environmental precautions:** Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Dike far ahead of spill for later recovery or disposal. Spilled material may be absorbed into an appropriate absorbent material.

**Methods for cleaning up:** Immediate cleanup of any spill is recommended. Notify fire authorities and appropriate federal, state, and local agencies. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, notify the National Response Center (phone number 800-424-8802).

## 7. HANDLING AND STORAGE

**Handling:** Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Use good personal hygiene practices.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

**Storage:** Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat and all sources of ignition. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	ACGIH	OSHA	Other:
Lubricant Base Oil (Petroleum)	TWA: 5mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup> as Oil Mist, if Generated	TWA: 5 mg/m <sup>3</sup> as Oil Mist, if Generated	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

**Engineering controls:** If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits additional engineering controls may be required.

### Personal Protective Equipment (PPE):

**Eye/Face:** Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary.

**Skin:** The use of gloves impervious to the specific material handled, such as nitrile, is advised to prevent skin contact and possible irritation (see manufacturers literature for information on permeability).

**Respiratory:** A NIOSH certified air purifying respirator with a Type 95 (R or P) particulate filter may be used under conditions where airborne concentrations are expected to exceed exposure limits.

Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode if there is potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

**Other Protective Equipment:** A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Note:** Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Clear and bright
Physical Form:	Liquid
Odor:	Characteristic petroleum
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	<1
Vapor Density (air=1):	>1
Boiling Point/Range:	No data
Melting/Freezing Point:	<5°F / <-15°C
Pour Point:	<10°F / <-12°C
Solubility in Water:	Insoluble
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.87 - 0.90 @ 60°F (15.6°C)
Bulk Density:	7.3 - 7.9 lbs/gal
Viscosity:	8.5 - 32 cSt @ 100°C; 68 - 460 cSt @ 40°C
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	<1
Flash Point:	>356°F / >180°C
Test Method:	Cleveland Open Cup (COC), ASTM D92
LEL (vol % in air):	No data
UEL (vol % in air):	No data
Autoignition Temperature:	No data

## 10. STABILITY AND REACTIVITY

**Stability:** Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

**Conditions to Avoid:** Extended exposure to high temperatures can cause decomposition.

**Materials to Avoid (Incompatible Materials):** Avoid contact with strong oxidizing agents, strong acids and strong bases.

**Hazardous Decomposition Products:** Combustion can yield oxides of carbon, nitrogen and sulfur.

**Hazardous Polymerization:** Will not occur.

## 11. TOXICOLOGICAL INFORMATION

### Chronic Data:

#### Lubricant Base Oil (Petroleum)

**Carcinogenicity:** The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and/or dewaxing to remove aromatics and improve performance characteristics. They contain low concentrations of PAH's and none have been identified as a carcinogen by NTP, IARC or OSHA.

### Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Lubricant Base Oil (Petroleum)	>5 g/kg	>2 g/kg	No Data

## 12. ECOLOGICAL INFORMATION

## 12. ECOLOGICAL INFORMATION

Lubricant oil basestocks are complex mixtures of hydrocarbons (primarily branched chain alkanes and cycloalkanes) ranging in carbon number from C15 to C50. The aromatic hydrocarbon content of these mixtures varies with the severity of the refining process. White oils have negligible levels of aromatic hydrocarbons, whereas significant proportions are found in unrefined basestocks. Olefins are found only at very low concentrations. Volatilization is not significant after release of lubricating oil basestocks to the environment due to the very low vapor pressure of the hydrocarbon constituents. In water, lubricating oil basestocks will float and will spread at a rate that is viscosity dependent. Water solubilities are very low and dispersion occurs mainly from water movement with adsorption by sediment being the major fate process. In soil, lubricating oil basestocks show little mobility and adsorption is the predominant physical process.

Both acute and chronic ecotoxicity studies have been conducted on lubricant base oils. Results indicate that the acute aquatic toxicities to fish, Daphnia, Ceriodaphnia and algal species are above 1000 mg/l using either water accommodated fractions or oil in water dispersions. Since lubricant base oils mainly contain hydrocarbons having carbon numbers in the range C15 to C50, it is predicted that acute toxicity would not be observed with these substances due to low water solubility. Results from chronic toxicity tests show that the no observed effect level (NOEL) usually exceeds 1000 mg/l for lubricant base oils with the overall weight of experimental evidence leading to the conclusion that lubricant base oils do not cause chronic toxicity to fish and invertebrates.

Large volumes spills of lubricant base oils into water will produce a layer of undissolved oil on the water surface that will cause direct physical fouling of organisms and may interfere with surface air exchange resulting in lower levels of dissolved oxygen. Petroleum products have also been associated with causing taint in fish even when the latter are caught in lightly contaminated environments. Highly refined base oils sprayed onto the surface of eggs will result in a failure to hatch.

Extensive experience from laboratory and field trials in a wide range of crops has confirmed that little or no damage is produced as a result of either aerosol exposure or direct application of oil emulsion to the leaves of crop plants. Base oils incorporated into soil have resulted in little or no adverse effects on seed germination and plant growth at contamination rates up to 4%.

## 13. DISPOSAL CONSIDERATIONS

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste and is not believed to exhibit characteristics of hazardous waste. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

This material under most intended uses would become "Used Oil" due to contamination by physical or chemical impurities. Whenever possible, Recycle Used Oil in accordance with applicable federal and state or local regulations. Container contents should be completely used and containers should be emptied prior to discard.

## 14. TRANSPORTATION INFORMATION

### U.S. Department of Transportation (DOT)

**Shipping Description:** Not regulated  
**Note:** If shipped by land in a packaging having a capacity of 3,500 gallons or more, the provisions of 49 CFR, Part 130 apply. (Contains oil)

### International Maritime Dangerous Goods (IMDG)

**Shipping Description:** Not regulated  
**Note:** Federal compliance requirements may apply. See 49 CFR 171.12.

### International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

**UN/ID #:** Not regulated  
**Note:** Federal compliance requirements may apply. See 49 CFR 171.11.

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
<b>Packaging Instruction #:</b>	---	---	---
<b>Max. Net Qty. Per Package:</b>	---	---	---

## 15. REGULATORY INFORMATION

### CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):

This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

### CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health:	No
Chronic Health:	No
Fire Hazard:	No
Pressure Hazard:	No
Reactive Hazard:	No

### CERCLA/SARA - Section 313 and 40 CFR 372:

This material does not contain any chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372.

### EPA (CERCLA) Reportable Quantity (in pounds):

This material does not contain any chemicals with CERCLA Reportable Quantities.

### California Proposition 65:

This material does not contain any chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

### Canadian Regulations:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class  
None

### National Chemical Inventories:

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.  
All components are listed on the Canadian DSL.

**U.S. Export Control Classification Number:** EAR99

## 16. OTHER INFORMATION

<b>Issue Date:</b>	03-Jul-2007
<b>Status:</b>	Final
<b>Revised Sections or Basis for Revision:</b>	NFPA ratings (Section 2)
<b>MSDS Code:</b>	787305

### **MSDS Legend:**

ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

### **Disclaimer of Expressed and implied Warranties:**

The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.



# Material Safety Data Sheet

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

### Chevron Delo® 400

**Product Number(s):** CPS235101, CPS235109, CPS235117, CPS235118, CPS235119, CPS235120, CPS235200

**Synonyms:** Chevron Delo® 400 Multigrade SAE 15W-40, Chevron Delo® 400 SAE 10W, Chevron Delo® 400 SAE 10W-30, Chevron Delo® 400 SAE 20, Chevron Delo® 400 SAE 30, Chevron Delo® 400 SAE 40, Chevron Delo® 400 SAE 50

#### Company Identification

ChevronTexaco Global Lubricants  
6001 Bollinger Canyon Rd.  
San Ramon, CA 94583  
United States of America  
www.chevron-lubricants.com

#### Transportation Emergency Response

CHEMTREC: (800) 424-9300 or (703) 527-3887

#### Health Emergency

ChevronTexaco Emergency Information Center: Located in the USA. International collect calls accepted.  
(800) 231-0623 or (510) 231-0623

#### Product Information

email : lubemsds@chevrontexaco.com  
Product Information: (800) LUBE TEK  
MSDS Requests: (800) 414-6737

## SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Highly refined mineral oil (C15 - C50)	Mixture	70 - 95 %weight
Zinc alkyl dithiophosphate	68649-42-3	1 - 5 %weight

## SECTION 3 HAZARDS IDENTIFICATION

### IMMEDIATE HEALTH EFFECTS

**Eye:** Not expected to cause prolonged or significant eye irritation.

**Skin:** Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin.

**Ingestion:** Not expected to be harmful if swallowed.

**Inhalation:** Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

## SECTION 4 FIRST AID MEASURES

**Eye:** No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and

flush eyes with water.

**Skin:** No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

**Ingestion:** No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.

**Inhalation:** No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

## SECTION 5 FIRE FIGHTING MEASURES

### FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

**NFPA RATINGS:** Health: 0 Flammability: 1 Reactivity: 0

### FLAMMABLE PROPERTIES:

**Flashpoint:** (Cleveland Open Cup) 200 °C (392 °F) (Min)

**Autoignition:** No Data Available

**Flammability (Explosive) Limits (% by volume in air):** Lower: Not Applicable Upper: Not Applicable

**EXTINGUISHING MEDIA:** Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

### PROTECTION OF FIRE FIGHTERS:

**Fire Fighting Instructions:** This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

**Combustion Products:** Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion. Combustion may form oxides of: Nitrogen, Phosphorus, Sulfur .

## SECTION 6 ACCIDENTAL RELEASE MEASURES

**Protective Measures:** Eliminate all sources of ignition in vicinity of spilled material.

**Spill Management:** Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

**Reporting:** Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

## SECTION 7 HANDLING AND STORAGE

**Precautionary Measures:** Keep out of the reach of children.

**General Handling Information:** Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

**Static Hazard:** Electrostatic charge may accumulate and create a hazardous condition when handling

this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

**Container Warnings:** Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

## SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

### GENERAL CONSIDERATIONS:

Special note: Do not use in breathing air apparatus or medical equipment.

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

### ENGINEERING CONTROLS:

Use in a well-ventilated area.

### PERSONAL PROTECTIVE EQUIPMENT

**Eye/Face Protection:** No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

**Skin Protection:** No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.

**Respiratory Protection:** No respiratory protection is normally required.

If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

### Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	ACGIH	5 mg/m3	10 mg/m3	--	--
Highly refined mineral oil (C15 - C50)	OSHA Z-1	5 mg/m3	--	--	--

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

**Color:** Brown

**Physical State:** Liquid

**Odor:** Petroleum odor

**pH:** Not Applicable

**Vapor Pressure:** <0.01 mmHg @ 37.8 °C (100 °F)

**Vapor Density (Air = 1):** >1

**Boiling Point:** >315.6°C (600°F)

**Solubility:** Soluble in hydrocarbons; insoluble in water

**Freezing Point:** Not Applicable

**Melting Point:** Not Applicable

**Specific Gravity:** 0.87 - 0.9 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)

**Volatile Organic**

**Compounds (VOC):** 1.1 %weight

**Viscosity:** 6.6 cSt - 18 cSt @ 100°C (212°F) (Min)

## SECTION 10 STABILITY AND REACTIVITY

**Chemical Stability:** This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

**Incompatibility With Other Materials:** May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

**Hazardous Decomposition Products:** Hydrogen Sulfide (Elevated temperatures)

**Hazardous Polymerization:** Hazardous polymerization will not occur.

## SECTION 11 TOXICOLOGICAL INFORMATION

### IMMEDIATE HEALTH EFFECTS

**Eye Irritation:** The eye irritation hazard is based on evaluation of data for similar materials or product components.

**Skin Irritation:** The skin irritation hazard is based on evaluation of data for similar materials or product components.

**Skin Sensitization:** No product toxicology data available.

**Acute Dermal Toxicity:** The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.

**Acute Oral Toxicity:** The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.

**Acute Inhalation Toxicity:** The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

### ADDITIONAL TOXICOLOGY INFORMATION:

This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

During use in engines, contamination of oil with low levels of cancer-causing combustion products occurs. Used motor oils have been shown to cause skin cancer in mice following repeated application and

continuous exposure. Brief or intermittent skin contact with used motor oil is not expected to have serious effects in humans if the oil is thoroughly removed by washing with soap and water.

## SECTION 12 ECOLOGICAL INFORMATION

### ECOTOXICITY

The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.

### ENVIRONMENTAL FATE

This material is not expected to be readily biodegradable.

## SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

## SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

**DOT Shipping Description:** PETROLEUM LUBRICATING OIL

**IMO/IMDG Shipping Description:** PETROLEUM LUBRICATING OIL

## SECTION 15 REGULATORY INFORMATION

<b>EPCRA 311/312 CATEGORIES:</b>	1. Immediate (Acute) Health Effects:	NO
	2. Delayed (Chronic) Health Effects:	NO
	3. Fire Hazard:	NO
	4. Sudden Release of Pressure Hazard:	NO
	5. Reactivity Hazard:	NO

### REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Zinc alkyl dithiophosphate 03, 06

### CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: ENCS (Japan), IECSC (China), PICCS (Philippines), TSCA (United States).

One or more components has been notified but may not be listed in the following chemical inventories: DSL (Canada). Secondary notification by the importer may be required.

One or more components is listed on ELINCS (European Union). Secondary notification by the importer may be required.

One or more components does not comply with the following chemical inventory requirements: AICS (Australia), KECI (Korea).

**NEW JERSEY RTK CLASSIFICATION:**

Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Motor oil)

**WHMIS CLASSIFICATION:**

This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

**SECTION 16 OTHER INFORMATION**

**NFPA RATINGS:** Health: 0 Flammability: 1 Reactivity: 0

**HMIS RATINGS:** Health: 1 Flammability: 1 Reactivity: 0  
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, \*- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

**REVISION STATEMENT:** This revision updates the following sections of this Material Safety Data Sheet: 1-16

**Revision Date:** 06/22/2004

**ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:**

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - ChevronTexaco	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the ChevronTexaco Energy Research & Technology Company, 100 Chevron Way, Richmond, California 94802.

**The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control**

and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

□

# Material Safety Data Sheet

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

### Chevron Drive Train Fluid HD

**Product Use:** Transmission Fluid

**Product Number(s):** CPS226601, CPS226607, CPS226608, CPS226610

**Synonyms:** Chevron Drive Train Fluid HD SAE 10W, Chevron Drive Train Fluid HD SAE 30, Chevron Drive Train Fluid HD SAE 50, Chevron Drive Train Fluid HD SAE 60

#### Company Identification

Chevron Products Company

a division of Chevron U.S.A. Inc.

6001 Bollinger Canyon Rd.

San Ramon, CA 94583

United States of America

www.chevronlubricants.com

#### Transportation Emergency Response

CHEMTREC: (800) 424-9300 or (703) 527-3887

#### Health Emergency

Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

#### Product Information

email : lubemsds@chevron.com

Product Information: (800) LUBE TEK

MSDS Requests: (800) 414-6737

## SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Highly refined mineral oil (C15 - C50)	Mixture	80 - 100 %weight
Zinc alkyl dithiophosphate	68649-42-3	1 - 5 %weight

**SECTION 3 HAZARDS IDENTIFICATION****IMMEDIATE HEALTH EFFECTS**

**Eye:** Not expected to cause prolonged or significant eye irritation.

**Skin:** Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.

**Ingestion:** Not expected to be harmful if swallowed.

**Inhalation:** Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

**SECTION 4 FIRST AID MEASURES**

**Eye:** No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.

**Skin:** No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

**Ingestion:** No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.

**Inhalation:** No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

**Note to Physicians:** In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

**SECTION 5 FIRE FIGHTING MEASURES**

Leaks/ruptures in high pressure system using materials of this type can create a fire hazard when in the vicinity of ignition sources (eg. open flame, pilot lights, sparks, or electric arcs).

**FIRE CLASSIFICATION:**

OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

**NFPA RATINGS:** Health: 0 Flammability: 1 Reactivity: 0

**FLAMMABLE PROPERTIES:**

**Flashpoint:** (Cleveland Open Cup) 190 °C (374 °F) Minimum

**Autoignition:** No Data Available

**Flammability (Explosive) Limits (% by volume in air):** Lower: Not Applicable Upper: Not Applicable

**EXTINGUISHING MEDIA:** Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

**PROTECTION OF FIRE FIGHTERS:**

**Fire Fighting Instructions:** This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

**Combustion Products:** Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

**SECTION 6 ACCIDENTAL RELEASE MEASURES**

**Protective Measures:** Eliminate all sources of ignition in vicinity of spilled material.

**Spill Management:** Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

**Reporting:** Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

**SECTION 7 HANDLING AND STORAGE**

**Precautionary Measures:** DO NOT USE IN HIGH PRESSURE SYSTEMS in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.

Keep out of the reach of children.

**General Handling Information:** Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

**Static Hazard:** Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

**Container Warnings:** Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat,

flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

## SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

### GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

### ENGINEERING CONTROLS:

Use in a well-ventilated area.

### PERSONAL PROTECTIVE EQUIPMENT

**Eye/Face Protection:** No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

**Skin Protection:** No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.

**Respiratory Protection:** No respiratory protection is normally required.

If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

### Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	ACGIH	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	--	--
Highly refined mineral oil (C15 - C50)	OSHA Z-1	5 mg/m <sup>3</sup>	--	--	--

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

**Color:** Varies depending on specification

**Physical State:** Liquid

**Odor:** Petroleum odor

**pH:** Not Applicable

**Vapor Pressure:** <0.01 mmHg @ 37.8 °C (100 °F)

**Vapor Density (Air = 1):** >1

**Boiling Point:** >315°C (599°F)

**Solubility:** Soluble in hydrocarbons; insoluble in water

**Freezing Point:** Not Applicable

**Specific Gravity:** 0.88 - 0.91 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)

**Density:** 0.87 - 0.89 kg/l @ 15°C (59°F)

**Viscosity:** 6 - 26 mm<sup>2</sup>/s @ 100°C (212°F)

**Evaporation Rate:** No Data Available

#### **SECTION 10 STABILITY AND REACTIVITY**

**Chemical Stability:** This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

**Incompatibility With Other Materials:** May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

**Hazardous Decomposition Products:** None known (None expected)

**Hazardous Polymerization:** Hazardous polymerization will not occur.

#### **SECTION 11 TOXICOLOGICAL INFORMATION**

##### **IMMEDIATE HEALTH EFFECTS**

**Eye Irritation:** The eye irritation hazard is based on evaluation of data for similar materials or product components.

**Skin Irritation:** The skin irritation hazard is based on evaluation of data for similar materials or product components.

**Skin Sensitization:** The skin sensitization hazard is based on evaluation of data for similar materials or product components.

**Acute Dermal Toxicity:** The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.

**Acute Oral Toxicity:** The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.

**Acute Inhalation Toxicity:** The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

##### **ADDITIONAL TOXICOLOGY INFORMATION:**

This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group

2A), or possibly carcinogenic to humans (Group 2B). These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

## SECTION 12 ECOLOGICAL INFORMATION

### ECOTOXICITY

This material is not expected to be harmful to aquatic organisms. The ecotoxicity hazard is based on an evaluation of data for the components or a similar material.

### ENVIRONMENTAL FATE

**Ready Biodegradability:** This material is not expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.

## SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

## SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

**DOT Shipping Description:** PETROLEUM LUBRICATING OIL, NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR

**Additional Information:** NOT HAZARDOUS BY U.S. DOT. ADR/RID HAZARD CLASS NOT APPLICABLE.

**IMO/IMDG Shipping Description:** PETROLEUM LUBRICATING OIL; MAY BE REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

**ICAO/IATA Shipping Description:** PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO TI OR IATA DGR

## SECTION 15 REGULATORY INFORMATION

**EPCRA 311/312 CATEGORIES:** 1. Immediate (Acute) Health Effects: NO

2. Delayed (Chronic) Health Effects: NO

3. Fire Hazard: NO

4. Sudden Release of Pressure Hazard: NO

5. Reactivity Hazard: NO

**REGULATORY LISTS SEARCHED:**

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Zinc alkyl dithiophosphate 03, 06

**CHEMICAL INVENTORIES:**

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

**NEW JERSEY RTK CLASSIFICATION:**

Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Automatic transmission fluid)

**WHMIS CLASSIFICATION:**

This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

**SECTION 16 OTHER INFORMATION**

**NFPA RATINGS:** Health: 0 Flammability: 1 Reactivity: 0

**HMIS RATINGS:** Health: 1 Flammability: 1 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, \*- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

**LABEL RECOMMENDATION:**

Label Category : INDUSTRIAL OIL 1 - IND1

**REVISION STATEMENT:** This revision updates the following sections of this Material Safety Data Sheet: 1,3,9,11,12,16.

**Revision Date:** March 13, 2009

**ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:**

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

**The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.**



# MATERIAL SAFETY DATA SHEET

#1700, 407 2<sup>ND</sup> STREET S.W., CALGARY, ALBERTA T2P 2Y3  
**TELEPHONE: (403) 269-2242** FAX: (403) 269-2251  
1-613-996-6666 – CANUTEC – Transportation Emergency  
1-888-243-9771 – ChExSS – Chemical Exposure

## ENVIROPLUG COARSE

### SECTION I: IDENTIFICATION OF PRODUCT

**Product Name:** ENVIROPLUG COARSE  
**Chemical Family:** Natural mineral; Montmorillonite  
**WHMIS Classification:** D2A  
**Workplace Hazard:** Potential carcinogen; contains free silica

**Product Use:** Loss circulation material  
**TDG Classification:** Not regulated  
**Packaging Group:** Not applicable  
**PIN:** Not applicable  
**CAS#:** 1302-78-9

### SECTION II: HAZARDOUS INGREDIENTS

Ingredients	Percent (w/w)	CAS Number	LD <sub>50</sub> (Species/Route)	LC <sub>50</sub> (Species/Route)
Silica, crystalline Quartz	1-5 or 5-10	14808-60-7	Not available	Not available

### SECTION III: TOXICOLOGICAL PROPERTIES

**Route of entry:**  Skin  Eye Contact  Inhalation  Ingestion

**Effects of acute exposure:** May cause mechanical irritation in eyes. Drying of skin resulting in dermatitis. May cause irritation of the upper respiratory tract. This product contains crystalline silica. Breathing silica containing dust may not cause noticeable injury or illness even though permanent lung damage may be occurring.

**Effects of chronic exposure:** Chronic inhalation may cause silicosis, a progressive, disabling and sometimes fatal lung disease. Chronic inhalation exposure to crystalline silica quartz has been observed to cause lymph node effects, kidney effects and auto-immune disease.

**Exposure limits:** ACGIH-TLV 0.025mg/m<sup>3</sup> respirable – Silica, crystalline quartz

**Irritancy of product:** Eyes, upper respiratory tract

**Sensitization to product:** No information available.

**Carcinogenicity:** Bentonite is not listed by ACGIH, IARC, NTP or OSHA. Crystalline silica, when inhaled from occupational sources, is considered as a human carcinogen by IARC (Class 1) and by NTP. ACGIH classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

**Reproductive toxicity:** No information available

**Teratogenicity:** No information available

**Mutagenicity:** No information available

**Name of toxicological synergistic products:** No information available



# ENVIROPLUG COARSE

## SECTION IV: FIRST AID MEASURES

**Skin contact:** If irritation occurs, or when shift ends, wash with soap and water until clean

**Eye contact:** Flush with water until irritation ceases. If irritation persists, contact a physician

**Inhalation:** Move to area free from dust. If symptoms or irritation persist contact a physician. Inhalation may aggravate existing respiratory illness

**Ingestion:** No first aid required; material is non toxic.

## SECTION V: PHYSICAL DATA

**Physical state:** Solid

**Appearance and odour:** Light tan to grey powder or granules, odourless

**Odour threshold:** Not applicable

**Specific gravity:** 2.45-2.55

**Vapor pressure (mmHG):** Not applicable

**Vapor density (Air=1):** Not applicable

**Evaporation rate:** Not applicable

**Boiling point (°C):** Not applicable

**Freeze/Melting point (°C):** 1450

**pH:** 8-10 (5% suspension)

**Co-efficient of water/oil distribution:** Insoluble in water



# ENVIROPLUG COARSE

## SECTION VI: FIRE AND EXPLOSION DATA

**Conditions of flammability:** Not applicable

**Means of extinguishing:** Use media suitable for surrounding fire and packaging. Product becomes very slippery when wet, avoid using water as fire fighting agent.

**Flash point:** Not applicable

**Upper flammable limit:** Not applicable

**Lower flammable limit:** Not applicable

**Auto-ignition temperature:** Not applicable

**Hazardous combustion products:** Not applicable

**Explosion data-sensitivity to mechanical impact:** Not applicable

**Explosion data-sensitivity to static discharge:** Not applicable

## SECTION VII: REACTIVITY DATA

**Chemically unstable (conditions):** Stable

**Product incompatible with:** None known

**Conditions of reactivity:** Not available

**Hazardous decomposition products:** None known



# ENVIROPLUG COARSE

## SECTION VIII: PREVENTATIVE MEASURES

**Personal protective equipment:** NIOSH approved respirators for silica bearing dust. Goggles or safety glasses

**Specific engineering controls:** Use local exhaust ventilation, process enclosure or other engineering controls to maintain concentration of airborne dust below TLV.

**Procedures for leak/spills:** Wear an approved respirator. Vacuum if possible to avoid generating airborne dust. Collect uncontaminated material for repackaging. Collect contaminated material in an approved container for disposal. Avoid adding water; the product will become slippery when wet.

**Waste disposal:** Dispose in accordance with federal, provincial and local regulations. It is the responsibility of the end-user to determine if material meets the criteria of hazardous waste at the time of disposal. Empty packaging must be disposed of, or recycled, in accordance with local regulations.

**Handling procedures and equipment:** Avoid creating dust. Avoid breathing dust; wear an approved respirator. Practice reasonable caution and personal cleanliness. Avoid eye contact.

**Storage requirements:** Store in cool, dry area. Empty packages contain residual hazardous material; handle as if full.

**Special shipping information:** Not applicable

## SECTION IX: PREPARATION

**Date updated:** April 1, 2009

**Prepared by:** Product Safety Committee

All the recommendations and suggestions herein concerning this product are based upon tests and data believed to be reliable, however it is the user's responsibility to determine the safety, toxicity and sustainability for their own use of the product described herein. Since the actual use by others is beyond our control, no guarantee, expressed or implied, is made by Q'Max Solutions Inc. as to the effects of such use, the results to be obtained, or the safety and toxicity of the product nor does Q'Max Solutions Inc. assume any liability arising out of use by others. Nor is the information herein to be considered as absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.

# MATERIAL SAFETY DATA SHEET

## ABANTONITE

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**TRADE NAME:** ABANTONITE

**CHEMICAL CLASS:** Naturally occurring mineral.

**APPLICATIONS:** Oil well drilling fluid additive. Viscosifier.

**EMERGENCY TELEPHONE:** 281-561-1600

**SUPPLIER:** Supplied by a Business Unit of  
M-I L.L.C.  
P.O. Box 42842, Houston, Texas 77242-2842  
See cover sheet for local supplier.

**TELEPHONE:** 281-561-1509

**FAX:** 281-561-7240

**CONTACT PERSON:** Sam Hoskin - Manager, Occupational Health

### 2. COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT NAME:	CAS No.:	CONTENTS :	EPA RQ:	TPQ:
Silica, crystalline, quartz	14808-60-7	2-6 %		
Bentonite	1302-78-9	94-98 %		

### 3. HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW:

CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing airborne product. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

This product is a/an light tan to gray powder. Slippery when wet.

#### ACUTE EFFECTS:

#### HEALTH HAZARDS, GENERAL:

Particulates may cause mechanical irritation to the eyes, nose, throat and lungs. Particulate inhalation may lead to pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma. Dermatitis and asthma may result from short contact periods.

**INHALATION:** May be irritating to the respiratory tract if inhaled.

**INGESTION:** May cause gastric distress, nausea and vomiting if ingested.

**SKIN:** May be irritating to the skin.

**EYES:** May be irritating to the eyes.

#### CHRONIC EFFECTS:

**CARCINOGENICITY:**

IARC: Not listed. OSHA: Not regulated. NTP: Not listed.

ATTENTION! CANCER HAZARD. CONTAINS CRYSTALLINE SILICA WHICH CAN CAUSE CANCER.  
Risk of cancer depends on duration and level of exposure.

IARC Monographs, Vol. 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

**ROUTE OF ENTRY:**

Inhalation. Skin and/or eye contact.

**TARGET ORGANS:**

Respiratory system, lungs. Skin. Eyes.

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**4. FIRST AID MEASURES**

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**GENERAL:**

Persons seeking medical attention should carry a copy of this MSDS with them.

**INHALATION:**

Move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.

**INGESTION:**

Drink a couple of glasses water or milk. Do NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person. Get medical attention.

**SKIN:**

Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

**EYES:**

Promptly wash eyes with lots of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

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**5. FIRE FIGHTING MEASURES**

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**AUTO IGNITION TEMP. (°F):** N/D

**FLAMMABILITY LIMIT - LOWER(%):** N/D

**FLAMMABILITY LIMIT - UPPER(%):** N/D

**EXTINGUISHING MEDIA:**

Use extinguishing media appropriate for surrounding fire.

**SPECIAL FIRE FIGHTING PROCEDURES:**

No specific fire fighting procedure given.

**UNUSUAL FIRE & EXPLOSION HAZARDS:**

No unusual fire or explosion hazards noted.

**HAZARDOUS COMBUSTION PRODUCTS:**

This material is not combustible. No specific hazardous combustion products noted.

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**6. ACCIDENTAL RELEASE MEASURES**

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**PERSONAL PRECAUTIONS:**

Wear proper personal protective equipment (see MSDS Section 8).

**SPILL CLEAN-UP PROCEDURES:**

Avoid generating and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water. Do not contaminate drainage or waterways. Repackage or recycle if possible.

**7. HANDLING AND STORAGE****HANDLING PRECAUTIONS:**

Avoid handling causing generation of dust. Wear full protective clothing for prolonged exposure and/or high concentrations. Eye wash and emergency shower must be available at the work place. Wash hands often and change clothing when needed. Provide good ventilation. Mechanical ventilation or local exhaust ventilation is required.

**STORAGE PRECAUTIONS:**

Store at moderate temperatures in dry, well ventilated area. Keep in original container.

**8. EXPOSURE CONTROLS, PERSONAL PROTECTION**

INGREDIENT NAME:	CAS No.:	OSHA PEL:		ACGIH TLV:		OTHER:		UNITS:
		TWA:	STEL:	TWA:	STEL:	TWA:	STEL:	
Silica, crystalline, quartz	14808-60-7	*		0.1				mg/m3 resp.dus
Bentonite	1302-78-9	5		3				mg/m3 resp.dus

**INGREDIENT COMMENTS:**

\* OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m<sup>3</sup> / (%SiO<sub>2</sub>+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite.

**PROTECTIVE EQUIPMENT:****ENGINEERING CONTROLS:**

Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to reduce air contamination and keep worker exposure below the applicable limits.

**VENTILATION:** Supply natural or mechanical ventilation adequate to exhaust airborne product and keep exposures below the applicable limits.

**RESPIRATORS:** Use at least a NIOSH-approved N95 half-mask disposable or reuseable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reuseable particulate respirator. For exposures exceeding 10 x PEL use a NIOSH-approved N100 Particulate Respirator.

**PROTECTIVE GLOVES:**

Use suitable protective gloves if risk of skin contact.

**EYE PROTECTION:**

Wear dust resistant safety goggles where there is danger of eye contact.

**PROTECTIVE CLOTHING:**

Wear appropriate clothing to prevent repeated or prolonged skin contact.

**HYGIENIC WORK PRACTICES:**

Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**APPEARANCE/PHYSICAL STATE:** Powder, dust.  
**COLOR:** light tan to Grey.  
**ODOR:** Odorless or no characteristic odor.  
**SOLUBILITY DESCRIPTION:** Insoluble in water.  
**DENSITY/SPECIFIC GRAVITY (g/ml):** 2.45 - 2.55                      **TEMPERATURE (°F):** 68  
**VAPOR DENSITY (air=1):** N/A  
**VAPOR PRESSURE:** N/A                      **TEMPERATURE (°F):**  
**pH-VALUE, DILUTED SOLUTION:** 8 - 10                      **CONCENTRATION (%M):** 5

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## 10. STABILITY AND REACTIVITY

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**STABILITY:** Normally stable.

**CONDITIONS TO AVOID:**  
Not relevant.

**HAZARDOUS POLYMERIZATION:**  
Will not polymerize.

**POLYMERIZATION DESCRIPTION:**  
Not relevant.

**MATERIALS TO AVOID:**  
No incompatible materials noted.

**HAZARDOUS DECOMPOSITION PRODUCTS:**  
No specific hazardous decomposition products noted.

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## 11. TOXICOLOGICAL INFORMATION

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**TOXICOLOGICAL INFORMATION:**  
No toxicological data is available for this product.

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## 12. ECOLOGICAL INFORMATION

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**ECOLOGICAL INFORMATION:**  
Contact M-I Environmental Affairs for ecological information.

**ACUTE AQUATIC TOXICITY:**  
This product passes the mysid shrimp toxicity test required by the U.S. Environmental Protection Agency (EPA) Region VI (Gulf of Mexico) NPDES Permit, which regulates offshore discharge of drilling fluids, when tested in a standard drilling fluid. Contact M-I's Environmental Affairs Department for more information.

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## 13. DISPOSAL CONSIDERATIONS

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**WASTE MANAGEMENT:**

This product does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc, may render the resulting materials hazardous.

Empty containers retain residues. All labeled precautions must be observed.

**DISPOSAL METHODS:**

Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that containers are empty by RCRA criteria prior to disposal in a permitted industrial landfill.

**14. TRANSPORT INFORMATION**

<b>PRODUCT RQ:</b>	N/A
<b>U.S. DOT:</b>	
<b>U.S. DOT CLASS:</b>	Not regulated.
<b>CANADIAN TRANSPORT:</b>	
<b>TDGR CLASS:</b>	Not regulated.
<b>SEA TRANSPORT:</b>	
<b>IMDG CLASS:</b>	Not regulated.
<b>AIR TRANSPORT:</b>	
<b>ICAO CLASS:</b>	Not regulated.

**15. REGULATORY INFORMATION****REGULATORY STATUS OF INGREDIENTS:**

<b>NAME:</b>	<b>CAS No:</b>	<b>TSCA:</b>	<b>CERCLA:</b>	<b>SARA 302:</b>	<b>SARA 313:</b>	<b>DSL(CAN):</b>
Silica, crystalline, quartz	14808-60-7	Yes	No	No	No	Yes
Bentonite	1302-78-9	Yes	No	No	No	Yes

**US FEDERAL REGULATIONS:**

**WASTE CLASSIFICATION:** Not a hazardous waste by U.S. RCRA criteria. See Section 13.

**REGULATORY STATUS:**

This Product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

SECTION 313: This product does not contain toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

SARA 311 Categories:

- 1: Immediate (Acute) Health Effects.
- 2: Delayed (Chronic) Health Effects.

The components of this product are listed on or are exempt from the following international chemical registries:

TSCA (U.S.)  
DSL (Canada)

**STATE REGULATIONS:**

**STATE REGULATORY STATUS:**

This product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):  
Pennsylvania Right-to-Know.  
Illinois Right-to-Know.  
New Jersey Right-to-Know.

PROPOSITION 65: This product contains the following chemical(s) considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer or reproductive toxicity, and for which warnings are now required:  
Silica, crystalline

**CANADIAN REGULATIONS:  
LABELS FOR SUPPLY:**



**REGULATORY STATUS:**

This Material Safety Data Sheet has been prepared in compliance with the Controlled Product Regulations.

Canadian WHMIS Classification: D2A - Other Toxic Effects: Very Toxic Material

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**16. OTHER INFORMATION**

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**NPCA HMIS HAZARD INDEX:**

\* 1 Slight Hazard

**FLAMMABILITY:**

0 Minimal Hazard

**REACTIVITY:**

0 Minimal Hazard

**NPCA HMIS PERS. PROTECT. INDEX:**

E - Safety Glasses, Gloves, Dust Respirator

**USER NOTES:**

N/A = Not applicable N/D = Not determined

**INFORMATION SOURCES:**

OSHA Permissible Exposure Limits, 29 CFR 1910, Subpart Z, Section 1910.1000, Air Contaminants.

ACGIH Threshold Limit Values and Biological Exposure Indices for Chemical Substances and Physical Agents (latest edition).

Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans, Silica, Some Silicates, Coal Dust, and para-Aramid Fibrils, Vol. 68, World Health Organization, Lyon, France, 1997.

Product information provided by the commercial vendor(s).

**PREPARED BY:**

Sam Hoskin/bb

**REVISION No.:**

0

**MSDS STATUS:**

Approved.

**DATE:** September 16, 1998

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**DISCLAIMER:**

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.



# MATERIAL SAFETY DATA SHEET

#1700, 407 2<sup>ND</sup> STREET S.W., CALGARY, ALBERTA T2P 2Y3  
**TELEPHONE: (403) 269-2242** FAX: (403) 269-2251  
1-613-996-6666 – CANUTEC – Transportation Emergency  
1-888-243-9771 – ChExSS – Chemical Exposure

## ALCOMER 120L

### SECTION I: IDENTIFICATION OF PRODUCT

**Product Name:** ALCOMER 120L  
**Chemical Family:** Anionic polyacrylamide dispersed in light mineral oil  
**WHMIS Classification:** Class D-2(B)  
**Workplace Hazard:** Skin and eye irritant

**Product Use:** Liquid Sump Flocculant  
**TDG Classification:** Not Regulated  
**Packaging Group:** Not applicable  
**PIN:** Not applicable

### SECTION II: HAZARDOUS INGREDIENTS

Ingredients	Percent	CAS Number	LD <sub>50</sub> (Rat/Oral)	LC <sub>50</sub> (Species/Route)
Distillates (petroleum) hydrotreated heavy naphthenic	30-60	64742-52-5	Not available	Not established
Naphtha, petroleum, hydrotreated heavy	1-5	64742-48-9	Not available	Not established
Alcohols C12-15, ethoxylated propoxylated	1-5	68551-13-3	Not available	Not established

### SECTION III: TOXICOLOGICAL PROPERTIES

**Route of entry:**  Skin  Eye Contact  Inhalation  Ingestion

**Effects of acute exposure:** This product becomes a very viscous gel in contact with water, which is likely to happen if this product is ingested. May cause nausea and vomiting. Mists or sprays may cause respiratory irritation. Acute exposure to vapour may cause dizziness, drowsiness, headache, nausea and irritation of the respiratory tract. May cause moderate irritation and/or redness if it gets in contact with the eyes.

**Effects of chronic exposure:** Prolonged or repeated contact with this product tends to remove skin oils possibly leading to irritation and dermatitis. Prolonged or repeated exposure to vapour may cause CNS damage, as well as heart and blood disorders. Aspiration may cause chemical pneumonitis

**Exposure limits:** Not established

**Irritancy of product:** May cause moderate irritation and/or redness to the eyes. Mists or sprays may cause respiratory irritation. Acute exposure to vapour may cause dizziness, drowsiness, headache, nausea and irritation of the respiratory tract

**Sensitization to product:** Not available

**Carcinogenicity:** None of the components in this product at concentrations >0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

**Reproductive toxicity:** No data for product. No effects anticipated.

**Teratogenicity:** No data for product. No effects anticipated.

**Mutagenicity:** No data for product. No expected to be mutagenic

**Name of toxicological synergistic products:** No information available.



# ALCOMER 120L

## SECTION IV: FIRST AID MEASURES

**Skin contact:** Remove contaminated clothing. Wash exposed area thoroughly with soap and water. If irritation persists or develops, obtain medical attention.

**Eye contact:** Immediately flush eyes with gently flowing warm water for 15 minutes, or until irritation ceases. Obtain medical attention when flushing is complete.

**Inhalation:** Move to fresh air. Apply oxygen or artificial respiration if required. If breathing difficulties or distress continues obtain medical attention.

**Ingestion:** Do not induce vomiting. If vomiting occurs keep head below hips to prevent aspiration of vomits. Obtain immediate medical attention

## SECTION V: PHYSICAL DATA

**Physical state:** Liquid

**Appearance and odour:** White to off-white liquid; slight oily odour

**Odour threshold:** Not determined

**Specific gravity:** 1.1

**Vapor pressure (mmHG):** Not determined

**Vapor density (Air=1):** Not determined

**Evaporation rate:** Not available

**Boiling point (°C):** >100

**Freeze/Melting point (°C):** Not available

**pH:** 7.5 (1% Solution)

**Co-efficient of water/oil distribution:** Not applicable



# ALCOMER 120L

## SECTION VI: FIRE AND EXPLOSION DATA

**Conditions of flammability:** Product is not considered flammable, but may burn in a fire situation.

**Means of extinguishing:** Foam, dry chemical or carbon dioxide in preference to water spray. Water will cause extreme slipperiness.

**Flash point:** >93°C (PMCC)

**Upper flammable limit:** Not determined

**Lower flammable limit:** Not determined

**Auto-ignition temperature:** Not determined

**Hazardous combustion products:** Not applicable

**Explosion data-sensitivity to mechanical impact:** Not applicable

**Explosion data-sensitivity to static discharge:** Not determined

## SECTION VII: REACTIVITY DATA

**Chemically unstable (conditions):** Stable

**Product incompatible with:** Avoid contact with strong oxidants; may degrade polymer. Avoid extremes of temperature, especially frost and freezing conditions.

**Conditions of reactivity:** Not available

**Hazardous decomposition products:** Oxides of carbon and nitrogen, hydrocarbons, ammonia and/or hydrogen chloride vapour on combustion.



# ALCOMER 120L

## SECTION VIII: PREVENTATIVE MEASURES

**Personal protective equipment:** In absence of proper ventilation use approved respirator with organic vapour/mist cartridges as required. Wear impervious gloves. Use chemical goggles and/or face shield. Suggest rubber apron.

**Specific engineering controls:** Use local exhaust ventilation, process enclosure or other engineering controls to maintain level of airborne vapour or mist below TLV. Ensure eye wash station and safety shower are available.

**Procedures for leak/spills:** Use appropriate safety equipment. Eliminate sources of ignition. Stop leak if possible to do so without risk. Small spills: Soak up with absorbent; collect absorbent in approved container for disposal; wash spill area with water. Large spills: Dike to prevent material from entering sewers or public waterways; collect uncontaminated material for repackaging; collect contaminated material for disposal; treat remaining material as a small spill. Report spill to appropriate agencies as required.

**Waste disposal:** Dispose in accordance with federal, provincial and local regulations. It is the responsibility of the end-user to determine if material meets the criteria of hazardous waste at the time of disposal. Empty containers, that have not been cleaned and purged, must be disposed or, or recycled, in accordance with local regulations.

**Handling procedures and equipment:** Warning! Eye and skin irritant. In accordance with good industrial practice, handle with care and avoid unnecessary personal contact. Avoid contact with eyes and prolonged or repeated skin contact. Avoid breathing vapours, mists or sprays. Use only with adequate ventilation. Remove contaminated clothing; launder or dry-clean before reuse. Wash thoroughly with soap and water after using. For industrial use only. Slip hazard when wet.

**Storage requirements:** For industrial use only. Slip hazard when wet. Store in the original container, securely closed, in a cool and dry location. Avoid temperature extremes, especially frost and freezing conditions. Empty containers contain residual hazardous material and should be handled and stored as if full.

**Special shipping information:** Not applicable

## SECTION IX: PREPARATION

**Date updated:** April 1, 2009

**Prepared by:** Product Safety Committee

All the recommendations and suggestions herein concerning this product are based upon tests and data believed to be reliable, however it is the user's responsibility to determine the safety, toxicity and sustainability for their own use of the product described herein. Since the actual use by others is beyond our control, no guarantee, expressed or implied, is made by Q'Max Solutions Inc. as to the effects of such use, the results to be obtained, or the safety and toxicity of the product nor does Q'Max Solutions Inc. assume any liability arising out of use by others. Nor is the information herein to be considered as absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.

**MATERIAL SAFETY DATA SHEET**

**Section 1 - IDENTIFICATION**

**Product Name:** Portland Cements

**CAS Reg. No.:** 65997-15-1

**Chemical Name and Synonyms:** Portland Cement, Cement, Hydraulic Cement

**Trade Names:** Portland Cement – Types I, IA, II, III, IIIA, GU, MS, HE; SAYLOR'S® Portland Types: I, IA, II, III; PRONTO®, Flamingo Brixment® White Portland Cement; Oil Well Cement Class A, H.

**MSDS Information:** This MSDS supersedes prior MSDS's for the products noted above. This MSDS covers a number of products with similar applications and occupational exposure hazards. Specific constituents and methods of preparation for these products will vary. The term "Portland Cement", used in the text of this MSDS, refers to the above named products collectively.

**Chemical Family:** Calcium silicate compounds; calcium compounds containing iron and aluminum; and gypsum are the primary constituents of these products.

**Informational Phone Numbers:**  
 (800) 437-7762 Customer Service - Nazareth, PA  
 (800) 336-0366 Customer Service - Speed, IN  
 (800) 624-8986 Customer Service - Martinsburg, WV  
 (800) 386-2111 Customer Service - Mississauga, ONT

**Emergency Contact Information:** (800)-424-9300 Chemtrec

**MSDS Prepared by:** Essroc MSDS Development Committee - (610) 837-6725 – May 18, 2010

**Section 2 - COMPONENTS**

**Hazardous Ingredients:**

Component	CAS No.	OSHA PEL (8-hour TWA)	ACGIH TLV	Other Information
Portland Cement	65997-15-1	15 mg total dust/m <sup>3</sup> 5 mg respirable dust/m <sup>3</sup>	1.0 mg/m <sup>3</sup> respirable	IDLH: 5000 mg/m <sup>3</sup> LD <sub>50</sub> : No Data
Gypsum	13397-24-5	15 mg total dust/m <sup>3</sup> 5 mg respirable dust/m <sup>3</sup>	10 mg/m <sup>3</sup>	IDLH: Not Determined LD <sub>50</sub> : No Data
Limestone	1317-65-3	15 mg total dust/m <sup>3</sup> 5 mg respirable dust/m <sup>3</sup>	10 mg/m <sup>3</sup>	IDLH: Not Determined LD <sub>50</sub> : No Data
Crystalline Silica ( < 0.3%)	14808-60-7	For mineral dusts containing crystalline silica: (10 mg respirable dust/m <sup>3</sup> )/(%SiO <sub>2</sub> +2) (30 mg total dust/m <sup>3</sup> )/( %SiO <sub>2</sub> + 2)	0.025 mg/m <sup>3</sup> respirable	IDLH: 50 mg/m <sup>3</sup> (twa) LD <sub>50</sub> : ipr rat LD Lo 400 mg/kg

Notes:

**Trace Elements:** Portland cement is made from materials mined from the earth and processed using energy provided by fuels. Trace amounts of naturally occurring potentially harmful chemicals might be detected during chemical analysis. Trace constituents may include calcium oxide (also known as free lime or quick lime), free magnesium oxide, potassium and sodium sulfate compounds, chromium compounds, and nickel compounds.

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### **Section 3 - HAZARDS IDENTIFICATION**

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#### **EMERGENCY OVERVIEW:**

Portland Cement is a powder that poses little immediate hazard. A single short-term exposure to the dry powder is not likely to cause serious harm. However, exposure of sufficient duration to wet Portland Cement can cause serious, potentially irreversible tissue (skin or eye) destruction in the form of chemical (caustic) burns, including third degree burns. The same type of tissue destruction can occur if wet or moist areas of the body are exposed for sufficient duration to dry Portland Cement.

#### **POTENTIAL HEALTH EFFECTS**

**Relevant Routes of Exposure:** Eye contact, skin contact, inhalation and ingestion.

**Effects resulting from eye contact:** Exposure to airborne dust may cause immediate or delayed irritation or inflammation.

Eye contact by larger amounts of dry powder or splashes of wet Portland Cement may cause effects ranging from moderate eye irritation to chemical burns and blindness. Such exposures require immediate first aid (see Section 4) and medical attention to prevent significant damage to the eye.

**Effects resulting from skin contact:** Discomfort or pain cannot be relied upon to alert a person to hazardous skin exposure. Consequently, the only effective means of avoiding skin injury or illness involves minimizing skin contact, particularly contact with wet Portland Cement. Exposed persons may not feel discomfort until hours after the exposure has ended and significant injury has occurred.

Exposure to dry Portland Cement may cause drying of the skin with consequent mild irritation or more significant effects attributable to aggravation of other conditions. Dry Portland Cement contacting wet skin or exposure to moist or wet Portland Cement may cause more severe skin effects including thickening, cracking, or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of (caustic) chemical burns.

Some individuals may exhibit an allergic response upon exposure to Portland Cement, possibly due to trace amounts of chromium. The response may appear in a variety of forms ranging from a mild rash to severe skin ulcers. Persons already sensitized may react to their first contact with the product. Other persons may first experience this effect after years of contact with Portland Cement products.

**Effects resulting from inhalation:** Portland Cement may contain free crystalline silica. Prolonged exposure to airborne free crystalline silica may cause delayed lung injury including silicosis, a disabling and potentially fatal lung disease, and/or other diseases. (also see "Carcinogenic potential" below.)

Inhalation may also aggravate other lung conditions. Exposure to Portland Cement may cause irritation to the moist mucous membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose.

**Effects resulting from ingestion:** Although ingestion of small quantities of Portland Cement is not known to be harmful, ill effects are possible especially if larger quantities are consumed. Portland Cement should not be eaten.

**Carcinogenic potential:** Portland Cement is not listed as a carcinogen by the National Toxicology Program (NTP), International Agency for Research (IARC) or the Occupational Safety and Health Administration (OSHA). However, Portland Cement contains trace amounts of crystalline silica and hexavalent chromium which are classified by IARC and NTP as known human carcinogens.

#### **Medical conditions which may be aggravated by inhalation or dermal exposure:**

Pre-existing upper respiratory and lung diseases.

Unusual (hyper) sensitivity to hexavalent chromium (chromium<sup>+6</sup>) salts.

---

**Section 4 - FIRST AID**

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**Eyes:** Immediate flush eyes thoroughly with water. Continue flushing eye for at least 15 minutes including under lids, to remove all particles. Call physician immediately.

**Skin:** Wash skin with cool water and pH-neutral soap or a mild detergent intended for use on skin. Seek medical treatment in all cases of prolonged exposure to wet cement, cement mixtures, liquids from fresh cement products, or prolonged wet skin exposure to dry cement.

**Inhalation of Airborne Dust:** Remove to fresh air. Seek medical help if coughing and other symptoms do not subside. ("Inhalation" of gross amounts of Portland Cement requires immediate medical attention.)

**Ingestion:** Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

---

**Section 5 - FIRE AND EXPLOSION DATA**

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Portland Cement is not combustible.

Flash Point:	Not applicable	Upper Explosive Limit:	Not applicable
Auto ignition temperature:	Not applicable	Lower Explosive Limit:	Not applicable
Auto ignition temperature:	Not applicable	Extinguishing media:	Not applicable
Hazardous combustion products:	Not applicable	Unusual fire and explosion hazards:	None
Special fire fighting procedures:	Portland Cement poses no fire-related hazards. Self-contained breathing apparatus is recommended to limit exposure to combustion products when fighting any fire.		

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**Section 6 - ACCIDENTAL RELEASE MEASURES**

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Collect dry material using a scoop. Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin. Wear appropriate personal protective equipment as described in Section 8.

Scrape up wet material and place in appropriate container. Allow the material to "dry" before disposal. Do not attempt to wash Portland Cement down drains.

Dispose of waste material according to local, state, and federal regulations.

---

**Section 7 - HANDLING AND STORAGE**

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Keep Portland Cement dry until used. Normal temperatures and pressures do not affect the material. Promptly remove dusty clothing or clothing which is wet with cement fluids and launder before reuse. Wash thoroughly after exposure to dust or wet cement mixtures or fluids.

---

**Section 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION**

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**Skin protection:** Prevention is essential to avoid potentially severe skin injury. Avoid contact with unhardened (wet) Portland Cement products. If contact occurs, promptly wash affected area with soap and water. Where prolonged exposure to unhardened Portland Cement products might occur, wear impervious clothing and gloves to eliminate skin contact. Where required, wear boots that are impervious to water to eliminate foot and ankle exposure.

Do not rely on barrier creams. Barrier creams should not be used in place of gloves.

Periodically wash areas contacted by dry Portland Cement or by wet cement or fluids with a pH neutral soap. Wash again at the end of the work. If irritation occurs, immediately wash the affected area and seek treatment. If clothing becomes saturated with wet cement, it should be removed and replaced with clean dry clothing.

**Respiratory protection:** Avoid actions that cause dust to become airborne. Use local or general ventilation to control exposures below applicable exposure limits.

Use NIOSH/MSHA-approved (under 30 CFR 11) or NIOSH-approved (under 42 CFR 84) respirators in poorly ventilated areas, if an applicable exposure limit is exceeded, or when dust causes discomfort or irritation.

**Ventilation:** Use local exhaust or general dilution ventilation to control exposure within applicable limits.

**Eye protection:** When engaged in activities where cement dust or wet cement could contact the eye, wear safety glasses with side shields or goggles. In extremely dusty environments and unpredictable environments, wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with Portland Cement or fresh cement products.

---

**Section 9 - PHYSICAL AND CHEMICAL PROPERTIES**

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Appearance:	Grey, white powder	Odor:	No distinct odor
Physical state:	Solid (powder)	pH (in water):	12 to 13
Solubility in water:	Slightly soluble (0.1 to 1.0%)	Vapor pressure:	Not applicable
Vapor density:	Not applicable	Boiling point:	Not applicable (>1000° C)
Melting point:	Not applicable	Specific gravity (H <sub>2</sub> O=1.0):	2.80 - 3.00
Evaporation Rate:	Not applicable	Coefficient of oil to water distribution:	Not applicable

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**Section 10 - STABILITY AND REACTIVITY**

---

**Stability:** Stable

**Conditions to avoid:** Unintentional contact with water.

**Incompatibility:** Wet Portland Cement is alkaline. As such it is incompatible with acids, ammonium salts and aluminum metal.

**Hazardous decomposition:** Will not spontaneously occur. Adding water results in hydration and produces (caustic) calcium hydroxide.

**Hazardous polymerization:** Will not occur.

---

**Section 11 - TOXICOLOGICAL INFORMATION**

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- Route of Entry.....Section 3
- Effects of acute exposure to product.....Section 3
- Effects of chronic exposure to product.....Section 3
- Exposure Limits.....Section 2
- Irritancy of product.....Section 3
- Sensitization to product .....Section 3
- Carcinogenicity.....Section 3
- Reproductive Toxicity.....Not Applicable
- Teratogenicity.....Not Applicable
- Mutagenicity.....Not Applicable
- Toxicologically synergistic products.....Section 3, Section 16

For a description of available, more detailed toxicological information, call one of the informational phone numbers listed at the end of Section 1.

---

**Section 12 - ECOLOGICAL INFORMATION**

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**Ecotoxicity:** No recognized unusual toxicity to plants or animals.

**Relevant physical and chemical properties:** See sections 9 and 10.

---

**Section 13 - DISPOSAL**

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Dispose of waste material according to local, state, and federal regulations. (Since Portland Cement is stable, uncontaminated material may be saved for future use.)

Dispose of bags in an approved landfill or incinerator.

---

**Section 14 - TRANSPORTATION DATA**

---

**Hazardous materials description/proper shipping name:** Portland Cement is not hazardous under U.S. Department of Transportation (DOT) regulations.

**Hazard class:** Not applicable.

**Identification number:** Not applicable

**Required label text:** Not applicable.

**Hazardous substances/reportable quantities (RQ):** Not applicable

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**Section 15 - OTHER REGULATORY INFORMATION**

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**Status under USDOL-OSHA & MSHA Hazard Communication Standards (29CFR 1910.1200 & 30CFR Part 47):** Portland Cement is considered a "hazardous chemical" under these regulations, and should be part of any hazard communication program.

**Status under CERCLA/Superfund, 40 CFR 117 and 302:** Not Listed

**Hazard Category under SARA TITLE III, Sections 311- 312:** Portland Cement qualifies as a "hazardous substance" with delayed health effects.

**Status under SARA Title III, Section 313:** This product contains NONE of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 in concentrations above deminimis levels.

**Toxic Substance Control Act (TSCA):** Some substances in Portland Cement are on the TSCA inventory list.

**Status under the Federal Hazardous Substances Act:** Portland Cement is a "hazardous substance" subject to statutes promulgated under the subject act.

**Status under Canadian Environmental Protection Act:** Not listed.

**Status under WHMIS:** Portland Cement is considered to be a hazardous material under the Hazardous Products Act as defined by the Controlled Products Regulations (Class D2A – Materials causing other toxic effects and Class E - Corrosive material) and is therefore subject to the labeling and MSDS requirements of the Workplace Hazardous Materials Information System (WHMIS).

---

**SECTION 16 - OTHER INFORMATION**

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**Abbreviations:**

ACGIH	American Conference of Government Industrial Hygienists
ASTM	American Society of Testing Materials
CAS	Chemical Abstract Service
CFR	Code of Federal Regulations
DOT	Department of Transportation
IARC	International Agency for Research
IDLH	Immediately dangerous to life and health (NIOSH).
m <sup>3</sup>	cubic meter
mg	Milligram
mm	millimeter
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicity Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
RQ	Reportable Quantities
SARA	Superfund Amendments and Reauthorization Act
TLV	Threshold Limit Value
TWA	Time Weighted Average
URT	Upper Respiratory Tract
WHMIS	Workplace Hazardous Material Information System

**Other important information:**

Portland Cement should only be used by knowledgeable persons. A key to using the product safely requires the user to recognize that Portland Cement chemically reacts with water, and that some of the intermediate products of this reaction (that is, those present while Portland Cement is "setting") pose a far more severe hazard than does Portland Cement itself.

While the information provided in this material safety data sheet is believed to provide a useful summary of the hazards of Portland Cement as it is commonly used, the sheet cannot anticipate and provide all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product.

In particular, the data furnished in this sheet do not address hazards that may be posed by other materials mixed with Portland Cement to produce Portland Cement products. Users should review other relevant material safety data sheets before working with this Portland Cement or working on Portland Cement products, for example, Portland Cement concrete.

SELLER MAKES NO WARRANTY, EXPRESSED OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY ESSROC CEMENT CORP., except that the product shall conform to contracted specifications. The information provided herein was believed by Essroc Cement Corp. to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of the product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for non-delivery of product, and whether based on contract, breach or warranty, negligence, or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.





**Other Data with Possible Relevance to Human Health:**

There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by fibrosis of the lungs, skin and other internal organs) and kidney disease.

For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine Volume 155, pages 761-768, 1997.

SKIN Potential irritant.	EYE Potential irritant.	INHALATION Irritation to lungs, nose, and throat.
<b>EMERGENCY FIRST AID PROCEDURES</b>		
EYES: Flush with water.	SKIN: Wash with soap and water.	
If inhaled and effects occur, move to fresh air. If breathing is irregular, administer oxygen		

**SECTION 6                      REACTIVITY DATA**

CONDITIONS CONTRIBUTING TO INSTABILITY Stable	INCOMPATIBILITY None
HAZARDOUS DECOMPOSITION PRODUCTS None	HAZARDOUS POLYMERIZATION Will not occur.

**SECTION 7                      SPILL OR LEAK PROCEDURES****STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED**

If uncontaminated, sweep up or collect, and reuse product. Product becomes slippery when wet.

**WASTE DISPOSAL METHOD**

Dispose of in accordance with all Federal, State and Local regulations.

**NEUTRALIZING CHEMICALS**

Not Applicable

**SECTION 8                      SPECIAL PROTECTION INFORMATION****RESPIRATORY PROTECTION**

Use NIOSH approved mechanical filter respirator for nontoxic dusts if dust concentration exceeds 10mg/m<sup>3</sup>

**VENTILATION**

Sufficient to keep dust levels below the TLV for crystalline silica.

**PROTECTIVE GLOVES**

General duty work gloves.

**EYE PROTECTION**

If high dust conditions exist, tight fitting goggles are recommended.

**OTHER PROTECTIVE EQUIPMENT**

Eyewash

**SECTION 9 SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING**

Store out of the weather. Product becomes slippery when wet. Avoid contact water in walk areas.

---

**OTHER PRECAUTIONS**

PROPER SHIPPING NAME	PLACARDS	HAZARD CLASS
Not Regulated	None	Not Hazardous
REPORTABLE QUANTITY	HAZARDOUS SUBSTANCE	ID NUMBER
None	None	None
LABEL		
None Required		

**SECTION 10 REGULATORY INFORMATION**

SARA requires the submission of annual reports of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This information must be included in all MSDS that are copied and distributed for this material. Components present in this product at a level which could require reporting under the statute are:

Chemical: CAS #:  
NONE

Toxic Substances Control Act (TSCA)  
The ingredients of this product are on the TSCA inventory.

**SECTION 11 STATE RIGHT TO KNOW**

Quartz is a Canadian WHMIS (Workplace Hazardous Material Information System) Ingredient Disclosure List, Massachusetts Substance List, New Jersey Right to Know Hazardous Substance List, and Pennsylvania Hazardous Substance List.

PREPARED BY: BLACK HILLS BENTONITE, LLC.

DATE: FEBRUARY, 2001

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[BACK](#)

## MATERIAL SAFETY DATA SHEET

Product Trade Name: **EZ-MUD®**

Revision Date: 02-Jan-2007

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: EZ-MUD®  
Synonyms: None  
Chemical Family: Blend  
Application: Shale Inhibitor

Manufacturer/Supplier: Baroid Drilling Fluids  
a Product Service Line of Halliburton Energy Services, Inc.  
P.O. Box 1675  
Houston, TX 77251  
Telephone: (281) 871-4000  
Emergency Telephone: (281) 575-5000

Prepared By: Chemical Compliance  
Telephone: 1-580-251-4335

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Hydrotreated light petroleum distillate	64742-47-8	10 - 30%	200 mg/m <sup>3</sup>	Not applicable

### 3. HAZARDS IDENTIFICATION

**Hazard Overview** May cause eye, skin, and respiratory irritation. May cause headache, dizziness, and other central nervous system effects. May be harmful if swallowed.

### 4. FIRST AID MEASURES

**Inhalation** If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

**Skin** Wash with soap and water. Get medical attention if irritation persists. Remove contaminated shoes and discard.

**Eyes** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

**Ingestion** Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration.

**Notes to Physician** Not Applicable

## 5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	> 200
Flash Point/Range (C):	Min: > 200
Flash Point Method:	Not Determined
Autoignition Temperature (F):	Min: > 93
Autoignition Temperature (C):	PMCC
Flammability Limits in Air - Lower (%):	> 392
Flammability Limits in Air - Upper (%):	> 200
	Not Determined
	Not Determined

**Fire Extinguishing Media** Water fog, carbon dioxide, foam, dry chemical.

**Special Exposure Hazards** Decomposition in fire may produce toxic gases. Use water spray to cool fire exposed surfaces.

**Special Protective Equipment for Fire-Fighters** Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

**NFPA Ratings:** Health 2, Flammability 1, Reactivity 0

**HMIS Ratings:** Flammability 1, Reactivity 0, Health 2

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautionary Measures** Use appropriate protective equipment.

**Environmental Precautionary Measures** Prevent from entering sewers, waterways, or low areas.

**Procedure for Cleaning / Absorption** Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

## 7. HANDLING AND STORAGE

**Handling Precautions** Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse.

**Storage Information** Store away from oxidizers. Keep container closed when not in use.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Engineering Controls** A well ventilated area to control dust levels. Local exhaust ventilation should be used in areas without good cross ventilation.

**Respiratory Protection** Organic vapor respirator with a dust/mist filter. In high concentrations, supplied air respirator or a self-contained breathing apparatus.

**Hand Protection** Impervious rubber gloves.

**Skin Protection** Rubber apron.

**Eye Protection** Chemical goggles; also wear a face shield if splashing hazard exists.

**Other Precautions** Eyewash fountains and safety showers must be easily accessible.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	White to gray
Odor:	Mild hydrocarbon
pH:	6-8

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Specific Gravity @ 20 C (Water=1):	1.0
Density @ 20 C (lbs./gallon):	8.3
Bulk Density @ 20 C (lbs/ft3):	Not Determined
Boiling Point/Range (F):	347
Boiling Point/Range (C):	175
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	Not Determined
Vapor Pressure @ 20 C (mmHg):	0.002
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	70
Evaporation Rate (Butyl Acetate=1):	< 1
Solubility in Water (g/100ml):	Partially soluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

## 10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid	Keep away from heat, sparks and flame.
Incompatibility (Materials to Avoid)	Strong oxidizers.
Hazardous Decomposition Products	Ammonia. Oxides of nitrogen. Carbon monoxide and carbon dioxide.
Additional Guidelines	Not Applicable

## 11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	May cause respiratory irritation. May cause central nervous system depression including headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.
Skin Contact	May cause skin irritation.
Eye Contact	May cause severe eye irritation.
Ingestion	Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal. May cause central nervous system depression including headache, dizziness, drowsiness, muscular weakness, incoordination, slowed reaction time, fatigue blurred vision, slurred speech, giddiness, tremors and convulsions.
Aggravated Medical Conditions	Lung disorders.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 1% are chronic health hazards.

**Other Information**                      None known.

**Toxicity Tests**

**Oral Toxicity:**                      Not determined  
**Dermal Toxicity:**                Not determined  
**Inhalation Toxicity:**            Not determined  
**Primary Irritation Effect:**      Not determined  
**Carcinogenicity**                Not determined  
**Genotoxicity:**                    Not determined  
**Reproductive /  
Developmental Toxicity:**      Not determined

**12. ECOLOGICAL INFORMATION**

**Mobility (Water/Soil/Air)**        Not determined  
**Persistence/Degradability**      BOD(28 Day): 40% of COD  
**Bio-accumulation**                Not Determined

**Ecotoxicological Information**

**Acute Fish Toxicity:**            TLM96: >1000 mg/l (Pimephales promelas)  
**Acute Crustaceans Toxicity:** TLM48: 98 mg/l (Acartia tonsa)  
**Acute Algae Toxicity:**        EC50: 16.70 mg/l (Skeletonema costatum)

**Chemical Fate Information**      Not determined  
**Other Information**                Not applicable

**13. DISPOSAL CONSIDERATIONS**

**Disposal Method**                Disposal should be made in accordance with federal, state, and local regulations.  
**Contaminated Packaging**        Follow all applicable national or local regulations.

**14. TRANSPORT INFORMATION**

**Land Transportation**

**DOT**  
Not restricted

**Canadian TDG**  
Not restricted

**ADR** Not restricted

**Air Transportation**

**ICAO/IATA** Not restricted

## Sea Transportation

IMDG Not restricted

## Other Shipping Information

Labels: None

## 15. REGULATORY INFORMATION

### US Regulations

<b>US TSCA Inventory</b>	All components listed on inventory.
<b>EPA SARA Title III Extremely Hazardous Substances</b>	Not applicable
<b>EPA SARA (311,312) Hazard Class</b>	Acute Health Hazard
<b>EPA SARA (313) Chemicals</b>	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
<b>EPA CERCLA/Superfund Reportable Spill Quantity For This Product</b>	Not applicable.
<b>EPA RCRA Hazardous Waste Classification</b>	If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.
<b>California Proposition 65</b>	All components listed do not apply to the California Proposition 65 Regulation.
<b>MA Right-to-Know Law</b>	Does not apply.
<b>NJ Right-to-Know Law</b>	Does not apply.
<b>PA Right-to-Know Law</b>	Does not apply.

### Canadian Regulations

<b>Canadian DSL Inventory</b>	All components listed on inventory.
<b>WHMIS Hazard Class</b>	D2B Toxic Materials

## 16. OTHER INFORMATION

**The following sections have been revised since the last issue of this MSDS**

Not applicable

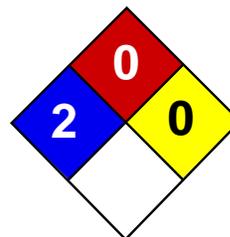
**Additional Information** For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

**Disclaimer Statement**

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

**\*\*\*END OF MSDS\*\*\***



Health	2
Fire	0
Reactivity	0
Personal Protection	E

## Material Safety Data Sheet Bentonite MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Bentonite

**Catalog Codes:** SLB1441, SLB2935, SLB4435

**CAS#:** 1302-78-9

**RTECS:** CT9450000

**TSCA:** TSCA 8(b) inventory: Bentonite

**CI#:** Not applicable.

**Synonym:** Montmorillonite;

**Chemical Name:** Not available.

**Chemical Formula:**  
(Al,Fe1.67Mg.33)Si10(OH)2Na(+ )Ca(++ )/2.33

**Contact Information:**

**Sciencelab.com, Inc.**  
14025 Smith Rd.  
Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**  
1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Bentonite	1302-78-9	100

**Toxicological Data on Ingredients:** Bentonite LD50: Not available. LC50: Not available.

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Hazardous in case of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (irritant), of ingestion.

**Potential Chronic Health Effects:**

Hazardous in case of inhalation. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs. Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention.

**Skin Contact:** Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

**Serious Skin Contact:** Not available.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

### Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

### Section 6: Accidental Release Measures

**Small Spill:**

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill:**

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

### Section 7: Handling and Storage

**Precautions:**

Do not breathe dust. Avoid contact with eyes. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area.

### Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protection:**

Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**

TWA: 10 from ACGIH (TLV) [United States] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Solid.

**Odor:** Odorless.

**Taste:** Not available.

**Molecular Weight:** Not available.

**Color:** Beige. (Light.)

**pH (1% soln/water):** Not available.

**Boiling Point:** Not available.

**Melting Point:** Decomposes.

**Critical Temperature:** Not available.

**Specific Gravity:** 2.5 (Water = 1)

**Vapor Pressure:** Not applicable.

**Vapor Density:** Not available.

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:**

Very slightly soluble in cold water, hot water. Insoluble in methanol, diethyl ether, n-octanol, acetone.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:** Not available.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

### Section 11: Toxicological Information

**Routes of Entry:** Eye contact. Inhalation.

**Toxicity to Animals:**

LD50: Not available. LC50: Not available.

**Chronic Effects on Humans:** Causes damage to the following organs: lungs.

**Other Toxic Effects on Humans:**

Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant), of ingestion.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

### Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are as toxic as the original product.

**Special Remarks on the Products of Biodegradation:** Not available.

### Section 13: Disposal Considerations

**Waste Disposal:**

### Section 14: Transport Information

**DOT Classification:** Not a DOT controlled material (United States).

**Identification:** Not applicable.

**Special Provisions for Transport:** Not applicable.

### Section 15: Other Regulatory Information

**Federal and State Regulations:** TSCA 8(b) inventory: Bentonite

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

**Other Classifications:**

**WHMIS (Canada):** CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

**DSCL (EEC):** R36- Irritating to eyes.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 0

**Reactivity:** 0

**Personal Protection:** E

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 0

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:14 PM

**Last Updated:** 11/01/2010 12:00 PM

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**MATERIAL SAFETY DATA SHEET**

Page 1

**PRODUCT: CPD SUPERPLUG**



**SECTION 01: PRODUCT INFORMATION**

**Manufacturer:** CPD Construction Products  
219 Connie Crescent # 13  
Concord, Ontario L4K 1L4

**Product Identifier:** CPD Superplug (fast setting hydraulic cement)

**Application and Use:** Water plug and fast setting patching compound.

**Product Description:** Blend of Hydraulic Cements and Silica Aggregate.

**Regulatory Classification:**

WHMIS - Class E (Corrosive)  
Class D Division 2 Subdivision A (Quartz)

**Transportation of Dangerous Goods Information:** Not regulated

**EMERGENCY NUMBERS**

CANUTEC: (613) 996-6666

**SECTION 02: HAZARDOUS INGREDIENTS**

The following component data is defined in accordance with sub-paragraph 13(a)(i) to (iv) or paragraph 14(a) of the Hazardous Products Act.

NAME	(pbw)%	CAS
Sand ** (Quartz)	30-60	14808-60-7
Portland Cement (Hydraulic Cement)	30-60	65997-15-1

Sand - LD50 - Not available - LC50 - Not available  
Portland Cement - LD50 - Not available LC50 - Not available

\*\* The sand used in this product contains crystalline silica (quartz). The quartz that exists as dust particles with an aerodynamic diameter less than 5 microns is hazardous. An approved dust mask (for crystalline silica) should be worn by workers handling this product in a dry state.

**SECTION 03: PHYSICAL DATA**

Physical State: Powder (Granular Solid)	Specific Gravity: 2.20
Vapour Pressure: Not applicable	Solubility in Water: <3%
PH (Aqueous Solution): 12.5	Boiling Point: Not applicable
Viscosity: Not applicable	Vapour Density (AIR=1): Not applicable
Evaporation Rate: Not applicable	% Volatile: None
Odour: None	Appearance: Dark Grey Powder containing fine silica sand.



MSDS-207  
May 2009

**MATERIAL SAFETY DATA SHEET**

**Page 2**

**SECTION 04: TOXICOLOGICAL PROPERTIES**

**NATURE OF HAZARD**

**INHALATION:** Crystalline Silica (Quartz) dust particles below 5 microns in diameter may be present in this product. Excessive inhalation of particles of this size (or smaller) may cause lung disease (Silicosis). The prolonged inhalation of dust may result in irritation of nasal tissue and the cornea (white) of the eye. Certain people may develop allergic dermatitis.

**EYE CONTACT:** May cause irritation to eye tissue on contact. Extreme exposure could lead to severe irritation if not immediately treated.

**SKIN CONTACT:** Will dry skin and cause defatting dermatitis. A latent period may exist between exposure and sense of irritation.

**INGESTION:** May cause burns. Irritation of mucous membranes of mouth, throat, esophagus and stomach will result from ingestion.

**CHRONIC:** Excessive exposure (Inhalation) could lead to development of the irreversible lung disease "Silicosis". Crystalline silica is classified by IARC as "2A - probably Carcinogenic to Humans". Also chronic local exposure may consist of multiple areas of superficial destruction of the skin or of primary irritant dermatitis. Similarly, chronic inhalation may result in varying degrees of irritation or damage to the respiratory tract tissues and an increased susceptibility to respiratory illness.

**OCCUPATIONAL EXPOSURE LIMIT:** Maximum TWA of silica is 0.2 mg/M<sup>3</sup> of air. For further information of the designated substance "Silica" contact the Ministry of Labour (Occupational Health and Safety Division) in your region.

**SECTION 05: FIRST AID MEASURES**

**INHALATION:** Remove to fresh air. If irritation of the respiratory tract is experienced seek medical attention.

**EYE CONTACT:** Flush eye "immediately" with water for at least 15 minutes holding eyelids open. If irritation persists seek medical attention.

**SKIN CONTACT:** Immediately wash with plenty of water for at least 15 minutes. Seek medical attention if rash results from contact.

**INGESTION:** Do not induce vomiting!! Give large quantities of water. If available, give several glasses of milk. If vomiting occurs spontaneously, keep airway clear. Seek immediate Medical attention!

**MATERIAL SAFETY DATA SHEET**

**Page 3**

**SECTION 06: PREVENTIVE MEASURES**

**PERSONAL PROTECTION:** Minimum safety equipment should consist of safety glasses with side shields, neoprene or PVC full length waterproof gloves and coveralls. An approved dust mask for crystalline silica dust should also be worn when large quantities of this product are being used. Observe good personal hygiene. No engineering controls required under normal conditions of application.

**HANDLING, STORAGE AND SHIPPING:** Replace container lid tightly when not using. **DO NOT ALLOW** product to get wet as it will harden. No temperature restrictions for storage. Shelf life is approximately 2 years in unopened original container.

**SPILL CONTROL AND DISPOSAL:** Sweep area with dust retarding floor sweeping compound. Dispose of as normal garbage. No special precautions required.

**SECTION 07: FIRE AND EXPLOSION DATA**

None. This product will not burn.

**SECTION 08: REACTIVITY DATA**

Stable. Hazardous decomposition will not occur.

**SECTION 09: PREPARATION**

Prepared By: R.J. Green  
Plant Manager  
CPD Construction Products  
Concord, Ontario L4K 1L4

# **Attachment 2**

Construction Site  
Best Management Practices

- Keep waste storage areas clean, well organized, and well equipped.
- Post information on proper storage, clean up and spill response at a visible and accessible location at all times.
- Educate employees and subcontractors about what a “significant” and “insignificant” spill is for each chemical used on-site and train in spill prevention and cleanup.
- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).
- Locate chemical storage and handling areas away from storm drains, waterways, or reservoirs.
- Do not store chemicals in areas where they may be susceptible to rain.
- Provide a secondary containment structure in case of leaks or spills.
- Always use a secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Place drip pans or absorbent material under paving equipment when not in use.
- Promptly transfer used fluids to the proper waste or recycling drums. Do not leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and pollute storm water. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal.
- Store cracked batteries in a non-leaking secondary container.
- If vehicles will be fueled on site:
  - Discourage “topping off”.
  - Use designated areas located away from waterways and drainages.
  - Use a secondary containment to catch drips or spills.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Clean up spills immediately and dispose of contaminated soils and clean up materials properly.
  - Sweep up dry spills. Do not wash or hose down the area.
  - Use absorbents for wet spills on impermeable surfaces.
  - Wet spills on soils require digging up and disposing of the contaminated soil.
- A secondary containment with enough capacity to contain a spill is required for fueling areas.

- Report significant spills to local and state agencies, such as the Fire Department or NDEP, who may assist in the cleanup.
- Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hours).
- Only a reputable, licensed company should be used to clean up large spills and dispose of contaminated materials.

## **Inspection and Maintenance:**

- On a weekly basis, ensure that an adequate supply of spill control cleanup materials are located close to storage, fueling, and unloading areas.
- Inspect containment structures in fueling and storage areas.
- Update spill prevention plans when the types of chemicals stored on site changes.
- Regularly inspect on-site vehicles and equipment for leaks, and repair them immediately

# Vehicle & Equipment Maintenance & Fueling

## GM-8

- Place a drip pan or sheet under vehicles when they are located over a water body (e.g. on a dock or a barge) and they will be idle for more than one hour (refer to fact sheet GM-20 for additional information).
- Fueling areas:
  - Locate at least 100 feet from waterways, channels and storm drains.
  - Protect from run-on and runoff by elevating or berming and covering the fueling area.
  - Located on a level-graded area.
  - Attended at all times during fueling.
- Equip fueling equipment with automatic shut-off nozzles to contain drips.
- Do not “top-off” fuel tanks.
- Avoid mobile fueling.
- Observe federal, state, and local requirements relating to any aboveground storage tank.
- Provide secondary containment for fuel tanks and other containerized hazardous materials. The volume of the secondary containment area shall be at least 1.5 times the volume of the primary container.
- Do not dump fuels and lubricants on the ground.
- Do not bury used tires.
- Do not dispose of oil in a dumpster or pour it down the storm drain.
- Properly dispose of used batteries.
- Conduct washing, fueling, and major maintenance offsite whenever possible.
- Inspect vehicles for leaky hoses, gaskets, or other problems.
- Locate vehicle services areas away from waterways, storm drains, gutters, and curbs.
- Use berms, sandbags, or other barriers to contain areas.
- Do not use detergents, solvents, degreasers, or other chemical products to do on-site cleaning.
- Use a drip pan or drip cloth if fluids will be drained and replaced on-site.
- Collect all used fluids, store in separate labeled containers, and either recycle or dispose of properly.

# Vehicle & Equipment Maintenance & Fueling

GM-8

## **Inspection and Maintenance:**

- Inspect on all containment structures.
- Maintain waste fluid containers in a leak proof condition.
- Service sumps associated with wash areas regularly.
- Inspect daily for leaks on vehicles and equipment.
- Keep an ample supply of spill cleanup materials available onsite.
- Clean up spills immediately and dispose of waste properly.
- Prevent boil-overs by regularly cleaning equipment radiators.

# Material Delivery, Handling, Storage & Use

GM-10

## **Standards and Specifications:**

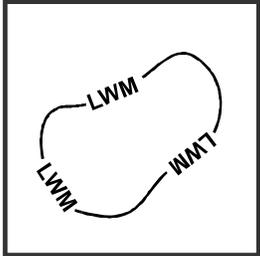
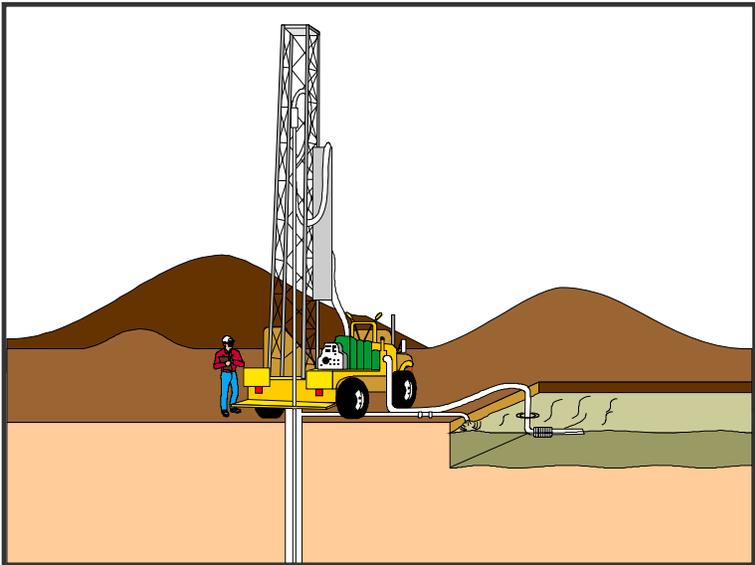
- Designate a storage area that is not near a storm drain or watercourse.
- All contractors and subcontractors must train employees in proper materials handling, storage, application and delivery procedures.
- Follow manufacturers' instructions on application, storage and disposal of materials.
- Store onsite only the amount of material necessary for the job.
- Use non-hazardous and environmentally friendly products.
- Provide indoor storage or cover stockpiled materials and wastes with a tarp.
- Provide covered storage for secondary containment of hazardous materials.
- Use secondary storage to prevent soil contamination.
- Monitor employees and subcontractors to ensure that proper practices are being implemented.
- Keep all material in original containers.
- Label all stored materials according to state, local and federal regulations.
- Do not store incompatible materials together.
- Keep adequate supply of cleanup materials on site at all times.
- Report all spills.
- Do not apply hazardous chemicals during wet or windy conditions.

## **Inspection and Maintenance:**

- Inspect storage areas weekly to ensure neatness.
- Post proper storage instructions and Material Safety Data Sheets (MSDS) for all currently stored materials.
- Repair and replace damaged secondary containment facilities.
- Remove all empty containers and packaging from site.
- Store materials with adequate clearances for access and emergency response.

# Liquid Waste Management

# GM-13



Map Symbol

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**Purpose:** To minimize or eliminate the discharge of on-site generated non-hazardous liquid waste to storm drains, gutters, watercourses and drainage channels.

**Applications:**

- Drilling slurries and fluids
- Dredgings
- Grease-free and oil-free wash waters

**Limitations:**

- Disposal of some wastes may be subject to specific permitting requirements (NDEP or the U.S. Army Corps of Engineers). Testing of dredging wastes may be necessary before a disposal method can be determined.
- Not applicable for dewatering, line flushing, landscape irrigation, or diverted stream flows.
- Not applicable to foundation drains, crawl space dewatering, or discharges from emergency firefighting.

**Standards and Specifications:**

- Protect drainage ways with earth dikes, filter fabric, sand bags etc. to divert or capture run off from operations. Gather and dispose of trapped material properly.
- Educate workers on how to identify a non-hazardous from a hazardous liquid waste.

- Educate workers that it is unacceptable to have any liquid waste enter storm drains, gutters or watercourses and drainage channels. Incorporate in safety meetings.
- Store and contain wastes in pits or portable tanks that are large enough to completely contain wastes. Locate where accidental discharge will not follow to storm drains, gutters, watercourses and drainage channels.
- If necessary, treat wastes by filtrations, sedimentation or chemical neutralization before disposal.

## **Inspection and Maintenance:**

- Monitor employees and subcontractors to ensure that proper practices are being implemented
- Remove deposited solids from containment areas and capturing devices. Dispose of offsite according to all local, state and federal regulations.
- Inspect containment areas and capturing devices for damages and leaks. Repair or replace as needed.

## **Standards and Specifications:**

- Contact Washoe County Environmental Health (775) 328-2436 regarding local hazardous waste management policies and procedures.
- Waste containers shall be constructed of a suitable material and properly labeled according to regulations. Labels must include type of material, time of collection and site location.
- Size temporary containment for stored materials at least 1.5 times the volume of the stored material. Materials must be stored in sealed drums.
- Temporary containment areas shall be free of accumulated storm water and spills.
- Temporary containment areas shall have room between containers for emergency response and cleanup.
- Incompatible materials shall be stored separately.
- Do not store different materials in the same container.
- Do not locate temporary containment areas near storm drains, gutters, watercourses or drainage channels.
- Provide adequate access to temporary containment areas.
- Store containers on pallets under a covered, protected area unless containers are water tight.
- Do not dispose of liquid waste in dumpsters or other solid waste containers.
- Collect water from decontamination procedures, treat it and dispose of it at an appropriate disposal site.
- Educate employees and subcontractors in waste storage and disposal. Ensure that proper procedures are followed.
- Train employees in newest procedures for handling materials. Update when new information is available.
- Immediately repair all dikes and liners used for storage or containment.
- Recycle materials if appropriate.

## **Inspection and Maintenance:**

- Ensure that all wastes are properly labeled and stored.
- Verify that all hazardous wastes are disposed of properly.
- Hazardous wastes must be collected, labeled and disposed of at authorized disposal sites.
- Keep supplies on site for cleanup of spills.
- Post MSDS sheets for all materials stored on site.
- Immediately repair all dikes and liners used for storage or containment.